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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL of EDUCATIONAL RESEARCH

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THE PREDICTION OF GROWTH[1]

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University of Michigan

PURPOSE

THE term "prediction" is easy to use in conversation but the person listening usually has difficulty in knowing just what is meant by its use. The purpose of this paper is to present several different connotations, and to define each in an attempt to clear up the confusion which now exists. The writer believes that the key to the laws of, and to control over, biologic growth, is easily grasped when a fundamental discrimination is made between the different senses in which the term prediction is used.

THE EVOLUTION OF PREDICTION

To understand prediction, however, we need to begin with a consideration of the forces and tendencies which lead man to make predictions. One of the basic satisfactions in life is awareness of ones self as a dynamic center of choice, controlling causes and producing effects at will. Nietzsche called this drive the "will-to-power." It is manifested even by animals very far down the evolutionary scale.

Probably the first distinctive actions which may be regarded as indicating the presence of a "will-to-power" drive in lower animals is behavior characteristic of "possession." Certain fishes will defend their nests against intruders and still lower animals fight for possession of mates. In most mammals, including man, the desire to assume the position of leader, with its resulting exaltation of the self-emotions, is a well-defined pattern of behavior, observable at every stage of development from infancy to old age.

A second, but less determinate, expression in behavior of the will-to-power is curiosity, and the exploring activities to which it gives rise. Elementary curiosity and investigation are wide-spread throughout the animal kingdom, while in man the attractiveness of anything which

[1] Read before the Michigan Academy of Science, Arts, and Letters, Ann Arbor, March 18, 1932.

promises to yield novel experiences rises at times, and in certain individuals, to a passion. The instinctive search of the new-born babe for his mother's breast initiates a long series of exploratory activities, most of which throughout life not only yield a very high type of pleasure but function to stimulate creative efforts. Proverbially, all children "want to see the wheels go around," and the major activity of adult nurture is frequently the keeping of Johnny and Mary from attempting to meddle in situations containing elements far beyond their limited powers of control. The adult form of the desire to satisfy curiosity is the drive which actuates the scientist in his patient and laborious attempts to discover the laws of nature and to use his knowledge of law both to satisfy his own desires and to shape the destiny of his age and race. The will-to-power, curiosity, exploratory activities and the scientific search for truth have thus a certain kinship.

There is also an important negative side to the will-to-power. When events happen unexpectedly, fear and uncertainty are engendered in those who perceive them as mysteries. Fear, however, seems to produce less discomfort in man than uncertainty. Primitive man preferred explanations based upon the postulated existence of supernatural beings to no-explanations-at-all for unaccountable happenings. For a long period man lived in slavery to his rationalizations. With the discovery of the inductive method of arriving at truth, the shackles of superstition began to disappear. Today the discovery of new truths is being made continuously by systematic, organized effort.

DEFINITION OF PREDICTION

The value of truth lies in the power which it confers on its possessor to direct experience as he wishes. Jesus' promise to his disciples, "Ye shall know the truth and the truth shall make you free," is an appeal to a *universal* desire. Man never feels so free as when he is able to manipulate forces and thus to produce at will the results which he desires. This sense of freedom, apparently, arises from power to prevision what effects will follow a given action, and the satisfaction which accompanies successful prediction comes from awareness of the correspondence between the actual effect and the previsioned effect. A true scientist never feels certain of a discovered truth until he is able to predict successfully what will happen under given conditions. Agreement of experience with prediction is the supreme test of scientific truth. That is "true" which works. Prediction is thus a most important aspect of scientific activity.

The primitive meaning of prediction is undoubtedly "to tell about an event before it happens." In all ages there have been individuals who have claimed to have supernatural power to see clearly, both into the future and into the past; witches, magicians, soothsayers, mediums, and others. The conventional explanation of their apparent power was either that the past and future was "revealed" to them by angels, devils and the like, or that these mystics possessed an additional organ of wider sense-perception, by which both the past and the future were perceived as present.

CLAIRVOYANCE

Let us call prediction used in this sense, clairvoyance. Clairvoyance may be defined as prediction which rests on no antecedent data. The prediction is made out of a clear sky. It is ordinarily made suddenly, without previous preparation or anticipation and has all the elements of mystery and "impossibility" which used to be ascribed to "revelations" from supernatural beings.

Clairvoyance is predicting the *scientifically unpredictable*. Needless to say clairvoyance, as such, has no standing in science. Power to make such predictions has not proved transferable at will and consequently it does not show up well under scientific scrutiny. However, there are actually many experiences in life which furnish support to the idea that the human mind has powers of perception far beyond those ordinarily under conscious control. To a talented mind the flash of power or insight which is experienced when "that-which-is-to-be-created" is first previsioned, has all the "feel" of revelation. Even in ordinary, systematic problem-solving, the culminating clicking-together of the separate elements into the sought-for pattern has something that feels "super"-normal about it. In post-hypnotic suggestion, and in other forms of subconscious cerebration, notably dreams, there are aspects of clairvoyance which make it certain much remains to be discovered about mental action before a satisfactory scientific explanation can be written covering all the known facts.[2] Until such phenomena prove subject to scientific control, however, science dismisses occasional successful predictions as "coincidences." Nevertheless, when such coincidences come within our own experiences, they are thought-provoking to say the least.

For instance, on March fifteenth, a year ago, I was riding on a train from Jerusalem to Cairo. In the compartment with me was an eminent

[2] Dunne, J. W. *An Experiment with Time*. New York: Macmillan Company, 1927.

M.D., a Hebrew specialist, called to Cairo in consultation. We fell to talking, as travelers will, and the conversation drifted to thought transference and clairvoyance in the monasteries of India where the gentleman had spent some years in study of the occult. He told of rather unusual experiences of this kind, and in response to my expressed doubt, "Why didn't they predict the World War, then?" he replied: "They did in great detail, and they are now concerned with the next world war which will start in February, 1932." I smiled my western incredulity and went on to other matters, but when the conflict between China and Japan materialized at the predicted time, I wished I had made inquiries for more details, in spite of the fact that *so far* the conflict has not materialized as a *world*-war.

INFERENCE

The objection to crediting such phenomena at their face value is always that the prophet *may be* in possession of information which others know nothing about. Keen observation and shrewd guesses on the part of the prophet reduce clairvoyance to mere "inference." To put "two and two-together" and hazard a guess as to what will probably follow, or as to what has previously occurred, is something we all do on occasion. Naturally there are individual differences, both in power to observe and organize the significant aspects in a given situation, and in power to make generalizations from what is seen. Exceedingly able persons seem, to less able persons, to possess "uncanny" powers of prediction. Sherlock Holmes was created to immortalize the ability of the exceptional individual to make true predictions on very inadequate data. Further, all instances of the exercise of "judgment" involve the element of prediction. We judge future value in terms of perceived elements and of the related future consequences known to us from past experiences. We recognize that such a prediction is a mere probability, and will be true or false only to the degree to which we have taken account of all the determining elements in the situation. Therefore, *inference*, the second form of prediction, which is worthy of definition, may be described as informal prediction. It is describing particular unseen events in the past or future in terms of the perceived present and the known past. The term is to be applied to specific isolated instances of prediction, in which the prediction rests on no systematic body of identified elements and proved generalizations.

TRUE PREDICTION

The third form of foretelling the future or of describing the past is *scientific* prediction. When an astronomer predicts an eclipse in advance of its occurrence, it appears to be a marvelous performance to an individual totally ignorant of how it was done. It seems like clairvoyance, but when one is able to make such a prediction himself, it is stripped of all mystery and becomes commonplace. True scientific prediction is mere interpolation or extrapolation, exactly similar to inference, but resting on a more certain basis of past experience and present observation. Both assume that under like conditions, identical causes produce identical effects. A scientist predicts what will happen in terms of what has been proved to happen on similar occasions in the past. Or starting with what now exists, a scientist describes all the events which lead from present conditions and predicts what event in the past must have been the cause of present observed effects.

A SOURCE OF CONFLICT

From one point of view, science may be said to be continually extending the range of situations in which it is able to make reliable predictions, and also to be continually increasing the reliability of the predictions which it makes. From another point of view, the most carefully made prediction may be considered to have no assured reliability whatsoever. *At any moment*, a new discovery may be made which will completely undermine the most carefully verified generalization. Philosophers delight in pointing out that finite man cannot possibly attain to absolute truth; that *all* scientific truth is necessarily relative; that scientific prediction must always remain a statement of probabilities, based on past experience.

THE CAUSE OF THE CONFLICT

It is important to note that this apparent conflict of views arises because science is called upon to deal with two distinct sorts of phenomena: (a) deterministic phenomena, and (b) creative phenomena. On the one hand, let deterministic phenomena be defined as those in which for a given situation all the factors have been discovered, and all their effects determined. Predictions in deterministic situations may then be made with confidence. On the other hand, let creative phenomena be defined as those which modify the factors operating in a given situation, or the conditions under which they operate. Creative forces give rise to new deterministic situations. Creative factors are those which *control* the

action of deterministic factors. It is always possible to add a factor to, or to remove a factor from, or to otherwise modify action in, a given situation. To make such modifications is a creative act. The important point to note is that the operation of a creative factor *always* vitiates to some degree the predictions made in advance of the creative act.

Perhaps to reduce the foregoing statements to a diagramatic form may help make meanings clear. (Figure I)

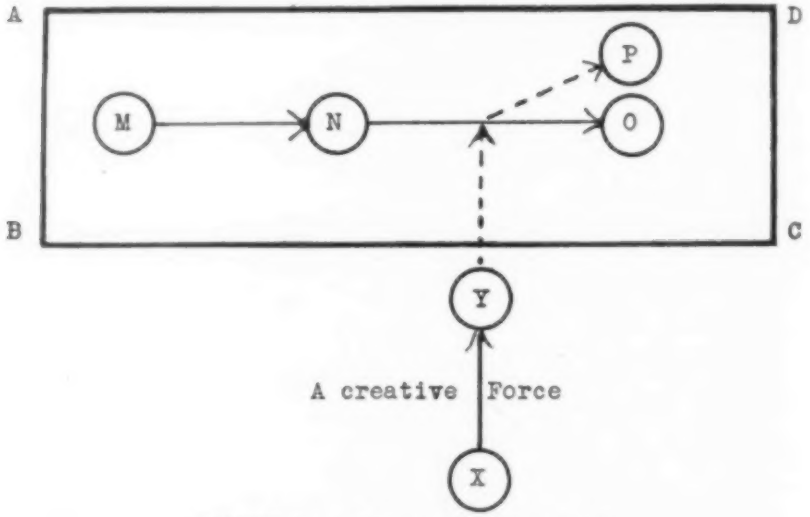

FIGURE I. A DETERMINISTIC SITUATION

Let ABCD represent a given deterministic situation in which element M acting on element N *always* results in effect 0. Let X be a creative force, which *when it acts*, introduces a new element, Y, into the situation, so that when M next acts its effect is determined by both N and Y. Under such conditions, the effect will not be 0 but some new effect, as P. The effect, 0 is, of course, scientifically predictable only so long as the creative force X does not act. The effect, 0, may have the highest probability and be based upon hundreds of thousands of repetitions of the M-N action. Nevertheless, the instant X acts, the prediction of 0 is vitiated by that action. The effect of action, P, no longer agrees with prediction.

So far in the history of science, more attention has been given to deterministic phenomena than to creative phenomena. However, science

really faces three basic problems instead of one, as is frequently supposed. These are:

A. What are the factors deterministic and creative which *may* operate in a given situation?

B. What determines whether or not each and every factor of both types *will operate* in the situation?

C. What *effects* are produced when a known set of factors do operate?

Problems A and C are deterministic in nature, but problem C has kept scientists so busy that, until very recently, they have not given attention to problem B. However, until *all three* problems have been *completely solved*, there can be no *assured certainty* in any prediction, no matter how deterministic the situation with which one deals.

ILLUSTRATIONS

Many people do not understand why scientists are in no way dismayed by the failure of their predictions, *so long as the failure is caused by the unexpected appearance of a new factor*. The answer is simple. The effect of the new factor is predictable once it is recognized, *but it would be unscientific to attempt to predict the unpredictable*.

Consider the prediction of the weather, for instance. Storm centers come in from the Pacific and move across our country in paths that are quite accurately predictable so long as no new factors enter the situation. But if, after predictions are made, a new storm sweeps down from the uncharted regions of the frozen north, all previous predictions must be modified to allow for the new factor. However, the new predictions are based upon the *same laws* as the first predictions, and the weather man does not admit at all that his first predictions were wrong except in the narrow sense that predicted and observed experience do not agree; he merely points to the fact that the information on which the prediction was based was *incomplete*. His predictions were absolutely correct for the information in his possession.

The law of gravitation is a well established law. By means of it, the positions of the planets can be calculated with great precision. When, however, it was found that the motion of one of the planets did not conform to the predicted path, astronomers did not proclaim the law of gravitation false. Instead they postulated a disturbing body and used the law of *gravitation* to compute where, and how large, the body must be. The discovery of Neptune from the perturbations in the orbit of Uranus in 1845 is one of the triumphs of scientific prediction. It marks

the acceptance by astronomers of the point of view in biology for which this paper contends.

THE DETERMINISTIC PREDICTION OF GROWTH

To speak of the scientific prediction of growth is to mean the prediction of growth in deterministic situations. Growth, therefore, is defined as the progress toward maturity made by an immature organism acted upon by constant nurture under constant conditions. Prediction does not refer *at all* to an attempt to foretell how long the situation *will remain* constant. Science deals only with the attempt to describe in advance of its occurrence, what course the growth will follow. Elsewhere[3] the writer has shown that for all biologic growth in which individual differences increase with age, so long as conditions remain constant (deterministic growth), the increases in the loglogs of the percentages of maturity are directly proportional to the increases in time. This is a universal law and may be used to *predict* growth under constant conditions, in the scientific use of the term, prediction.

ILLUSTRATION: INTERPOLATION

For instance, the percentage of normal school-children in a certain city[4] passing Binet test number 39 at age six and one-half was 9.6 percent, and at age thirteen and one-half, 99.4 percent. The generalization quoted in the previous paragraph makes it possible to interpolate the percentages of children passing the test at each year between six and one-half and thirteen and one-half. The period is seven years (13.5-6.5). The loglogs of the two known percentages are 0.0076 and –2.5850. The difference is –2.5926. Dividing this number by seven gives –.3704 as the change per year. Adding this quantity to 0.0076, the loglog value for age six and one-half yields –.3628, the loglog value for seven and one-half years. Repeating the addition for each year in turn, the following series is obtained: –.7332, –1.1036, –1.4740, –1.8444, –2.2148. Converting all these values to percentages, the results are 36.8 percent, 65.3 percent, 83.4 percent, 92.6 percent, 96.8 percent, 98.6 percent. The agreement of actual and predicted results is best seen by arraying the data in tabular form. (Table I).

---

[3] Courtis, S. A. "Maturation Units for the Measuring of Growth," *School and Society*, XXX, November 16, 1929.

[4] Burt, Cyril. *Mental and Scholastic Tests* (1925), page 132.

TABLE I

COMPARISON OF ACTUAL AND PREDICTED RESULTS

Age in years	7.5	8.5	9.5	10.5	11.5	12.5
Computed Results (predictions)	36.8	65.3	83.4	92.6	96.8	98.6
Observed Results (observations)	36.4	71.4	83.9	93.5	97.6	99.2
Differences	.4	−6.1	−.5	−.9	−.8	−.6

The agreement of prediction with fact is close except at age eight and a half.

ILLUSTRATION: EXTRAPOLATION

To many persons, however, such computations do not seem to merit the name prediction because the results are known before the computations are made. They say, "That's all very well when the action is over, but could you do that in advance of action?" The answer, of course, is yes. Extrapolation differs in no way from interpolation except that the effect of errors of measurement in the basic observations is greater on predictions the closer the two determining points are together. Given three reliably determined points anywhere on the growth curve, the entire curve can be described with precision.

For instance, consider the following problem. A certain boy[1] was given a twenty-word test in spelling. He spelled two words correctly. He was then allowed to study the words for a twenty-minute period, after which he was given the test again. His score in this second test was nine words correct.

On each of the following days he was given a similar study period, and a test at the close of the study period until he spelled all the words correctly. Predict the scores made each day and the number of days of study required to learn the twenty words.

The first step in making the necessary computations is to change the scores from measures of magnitude to measures of development. Each word spelled correctly of the twenty corresponds to 5 percent of the total growth. Scores of 2 and 9 words, therefore, represent developments of 10 percent and 45 percent respectively. The loglogs of these two percentages are "0" and "−.4599." The difference "−.4599" is the daily increase. Therefore, the loglog value for the score the second day would be found as before by adding the constant rate of growth, "−.4599" to the development at the beginning, "0," and repeating the addition until the growth curve approximates 100 percent. The series of values obtained is: beginning, 0; first day, −.4599; second day, −.9198; third day, −1.3797; fourth day, −1.8396; fifth day, −2.2995. The percentages corresponding to these loglog values are 10 percent, 45 percent, 75.7 per-

[1] An actual case.

cent, 90.8 percent, 96.7 percent, 98.9 percent respectively. Finding these percentages of 20, the total number of words in the test, yields scores of 2, 9, 15.1, 18.2, 19.3, 19.8; or in terms of the *nearest* whole word: 2, 9, 15, 18, 19, 20. These are *precisely* the scores the boy made and the prediction is perfectly fulfilled.

OBJECTIONS

Extrapolation corresponds much more closely to what most persons mean when they talk about prediction but they are seldom satisfied when they see such illustrations. They ask, "Did you actually make the predictions at the end of the first day?" In this case the answer is, "No, but they could have been made at the close of the first day, and have been made repeatedly in advance of action in similar situations." However, this does not satisfy doubting Thomases. "I can't believe," they reply, "that human behavior is so mechanical it can be reliably predicted in such a fashion. Why, the boy might have laid his pen down and not written a single word, if he had chosen to do so. What would have become of your predictions then?"

What such a protest really means is, not that the predictions so made are wrong, but that in situations involving human beings there is greater opportunity for the action of creative forces than in situations in the exact sciences. Before one can predict with assurance what a child will actually do in such a situation as that described, one must be able to make, not one prediction, but two. First, one must be able to predict whether or not the situation *will remain constant* during the period covered by the prediction, and second, one must be able to predict the sequence of growth which will take place under the constant conditions.

THE PRESENT SITUATION

The second problem has been rather completely solved. In a deterministic situation growth may be predicted with certainty when the following data are available.

A. The degree of development at the beginning of the growth cycle.
B. The maximum toward which the growth progresses.
C. The intensity of the nurture forces acting.
D. The quality of the organism acted upon.
E. The form of the distribution of the elements of nature in the organism.

Some of these elements are directly measurable, others can only be inferred. But if *three reliable* measurements of growth are secured, all

the elements can be determined and the entire growth curve precisely predicted, *so long as conditions stay constant.*

However, only a beginning has been made in solving the first problem, the prediction of the action of creative forces. Nevertheless, two important facts should be noted: (1) that even under present limited control of conditions, *predictions agree* with results within about 2 percent, and (2) that probably the greatest benefits that will result from the solution of the second problem are (a) that the first problem has been brought to consciousness as a problem, and (b) that the solution of the second problem enables one to make reliable measurements of the effects of *creative* forces. If a growth curve does not agree with predictions, it is evidence that some modifying influence has been at work. In Figure I, the perturbation, or difference between P and 0 is a signal that a creative force has acted and the magnitude of the perturbation is a measure of the intensity of the creative force.

ILLUSTRATION

For instance, consider the results secured in studying the development of ability to spell the two words "necessary" and "executive." The data secured from a survey in a certain school system were as follows: (Table II)

TABLE II

PERCENTAGES OF CHILDREN IN VARIOUS GROUPS SPELLING THE WORDS CORRECTLY

Ages	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5
Necessary	0	1	3	9	18	76*	72	83	82
Executive	0	1	3	8	17	36	52	63	76

*Necessary was taught to the thirteen year olds but to no other group: Executive was not taught in any group.

The mean loglog increase for both words during the intervals for which conditions were fairly constant is −.1806, mean deviation ±.048. The increase for "necessary" from age 12.5 to 13.5 is −.7958 or 4.4 times the mean increase. Therefore, the effect of teaching is 3.4 times the effect of incidental learning, since there would have been the usual increase even if the word had not been taught. Similarly the effect of any single factor may be measured by determining the change in rate of growth produced by it, when brought as a single variable into a deterministic situation.

CONCLUSIONS

It should be noted, however, that a still more difficult and ultimate problem remains to be solved; namely, the measurement of the creative

force which introduced the *teaching* of "necessary" into the situation. This creative force may be taken as the public desire for education, and it functions through the organization we call the school system. There are also innumerable other creative forces playing on, and through, the situation; sickness, desire for play, ideals, influence of love for the teacher, or parents, etc. The scores of a particular child will never be perfectly predictable until man becomes omniscient. But deterministic prediction is a first step toward that great goal.

The conclusion of this paper is that deterministic prediction of growth is a practical tool for the measurement (1) of growth in all deterministic situations; and (2) of the effect of the environmental and nature forces which are constantly injected *creatively* into deterministic situations. Intensity of growth is measured by the rate of growth, but the intensity of creative forces is measured by the *rate of change in the rate of growth*. The solution of the problem of predicting growth in deterministic situations thus clears the way for an attack upon the more complex problem of measuring creative action itself.

AN EXPERIMENT WITH THE DALTON PLAN

WILLIAM HERTZOG THOMPSON
Municipal University of Omaha

THE general question as to whether or not children make progress in school subjects faster under the Dalton Laboratory Plan than under other plans has been raised whenever comparisons with other schemes of school procedure have been made. Claims both pro and con are found in the literature. As these claims have been mainly subjective judgments on the part of protagonists and antagonists, it is a matter of concern that some objective evidence bearing on the question be gathered. The aim of this experiment was to make some objective measures of the progress made in the Ohio State University Demonstration School during the summer sessions of the years of 1928 and 1929, under the Dalton Laboratory Plan, and to compare the results with data obtained from two summer sessions of the Columbus, Ohio, public schools. Measures of progress were made in reading, composition, arithmetic, spelling, and handwriting.

In the pursuit of this study, certain operative factors, some to the advantage and others to the disadvantage of the Dalton Laboratory Plan, are recognized. It is not maintained that all of the values of the Dalton Plan are shown in a period of eight weeks or in two periods of this same length. Certain disadvantages, such as the limitation imposed by a short school term, the handicaps experienced on account of the pupils' being unused to the methods employed under the plan, and the distraction caused by many visitors during the school day, are evident. These circumstances, however, find some compensation in the fact that Miss Parkhurst, author of the Dalton Laboratory Plan, had control of the entire school administration, a faculty of her own selection who were expertly trained in the methods of the plan, adequate financial resources for the operation of her plans, a selected group of pupils, and a staff of sufficient size to permit no classes of over twenty pupils.

The pupils in grades V, VI, VII, and VIII in the Demonstration School conducted during the summer sessions of 1928 and 1929 by the Department of Principles of the Ohio State University, under the direction of Miss Helen Parkhurst, composed the experimental group. The pupils in grades V, VI, VII, and VIII of the Everett Junior High School and the McKinley Junior High School made up the control groups for 1928. The Everett Junior High School was the only school used in 1929 as a control group. Table I shows the enrollment:

TABLE I

ENROLLMENT

School	Grades				
	5	6	7	8	Total
Dalton					
1928	16	18	16	13	63
1929	14	11	7	5	37
Everett					
1928	9	12	16	7	54
1929	32	24	35	20	111
McKinley					
1928	15	36	6	10	67

A battery of standardized tests, composed of the Illinois General Intelligence Scale, Sangren-Woody Reading Test, Gates Reading Test, Pressey Reading Test, Lewis Composition Scale, Ayres Handwriting Scale, Morrison and McCall Spelling Test, and Compass Survey Test in Arithmetic, was given to each group at the beginning and at the end of each session. The results of these tests were compared as to the achievement of the groups. Individuals were then paired by means of equating as to chronological age, mental age, and grade placement in school. In the 1928 comparisons, it was possible to equate further by using the reading age as a variable together with the three mentioned. Gains were calculated and comparisons made, but no gain was considered significant unless it was larger than three times the probable error of the difference.

TABLE II

1928

MEDIANS—(Average of Grades V, VI, VII, VIII)

	Chronological Age	Mental Age	Arithmetic	Reading	Composition	Spelling	H. W. Q.	H. W. R.
Dalton								
First Testing	12.1	14.3	22.5	81.5	43.2	36.8	45.3	63.8
Second Testing			25.3	82.3	52.5	35.5	45.0	68.8
Gain			2.8	.8	9.3	−1.3	−.3	5.0
Grade Interval Gain			.3	.1	1.7	−.35	−.07	.9
Everett								
First Testing	12.7	11.7	13.7	53.5	31.0	32.0	41.5	57.3
Second Testing			19.0	66.0	32.3	30.5	39.7	66.3
Gain			5.3	12.5	1.3	−1.5	−1.8	9.0
Grade Interval Gain			.7	.8	.2	−.3	−.5	1.9
McKinley								
First Testing	12.3	11.8	12.5	62.0	30.3	30.5	40.5	56.7
Second Testing			18.8	67.0	28.8	29.5	40.0	63.5
Gain			4.3	5.0	−1.5	−1.0	−.5	6.8
Grade Interval Gain			.6	.4	−.3	−.2	−.1	1.4

Table II above shows the following considerations to be outstanding in regard to the initial status of the groups:

1. The experimental group was younger in chronological age than either control group.

2. In intelligence, the experimental group was distinctly superior in every grade to the control groups. There was little difference indicated between the control groups.

3. In composition, the Dalton School was superior to the controls in every grade. The Dalton School was above the norm in the seventh and eighth grades, whereas the control schools were below the norm in every grade.

4. The showing in the matter of handwriting quality was very inferior in every grade in all schools. The experimental group was superior to the control groups in the fifth and eighth grades and inferior in the sixth and seventh grades.

5. In handwriting rate, all schools were inferior. The Dalton School was superior to both control schools in every grade, except the seventh, in which the McKinley School was the highest.

6. In spelling, the Dalton School was above the norm and superior to the control schools in the sixth, seventh, and eighth grades, the control schools being below the norm in spelling in every grade.

7. The showing in arithmetic was inferior in all schools, but the Dalton School was distinctly superior in the seventh and eighth grades. The differences between the schools in the fifth and sixth grades were negligible.

8. The Dalton School was above the norm in every grade in reading, and was superior to the control schools which were below the norm in every grade.

GROUP COMPARISONS

The scores for both the initial and end tests were tabulated and medians calculated. Upon the basis of these medians for the various tests for each year, the first comparisons were made. The differences in the medians were indicated in terms of raw scores which were also transmuted to grade status equivalents to show relative progress as to grade interval. Each score for each individual in all of the tests was reduced to grade status, differences between the end and initial tests determined, and the gains tabulated. By these procedures, an indication of the progress of the schools is given. This treatment yields evi-

dence relative to the comparative progress of each school by grade and by subject as determined by the tests given.

TABLE III

1929

MEDIANS—(Average of Grades V, VI, VII, VIII)

	Chronological Age	Mental Age	Arithmetic	Composition	Spelling	Reading Speed	Reading D (Note Details)	Reading A (General Significance)
Dalton								
First Testing	12.2	14.0	20	45	36	47	82	93
Second Testing			26	44	37	46	98	94
Gain			6	−1	1	−1	16	1
Grade Interval Gain			.5	−.2	.2	−.2	3.8	.2
Everett								
First Testing	12.6	12.0	14	38	29	32	94	89
Second Testing			19	35	31	34	90	92
Gain			5	−3	2	2	−4	3
Grade Interval Gain			.6	−.4	.2	.4	−.6	.7

Tables II for 1928 and Table III for 1929 indicate the following differences in gains:

1. Differences in progress between the two types of schools were apparent, but were not consistently in favor of either school. This suggests that on the basis of group comparisons, progress in the formal functions is not shown to be affected by the type of school organization.

2. Advantages of more than a year in grade status appearing in 1928 in composition and in 1929 in reading for the Dalton School are not repeated in consecutive years.

PAIRED COMPARISONS

The method used was that of pairing individual cases, using one individual in the experimental group and one individual in a control group for each pair, matching the cases as nearly as possible, and yet obtaining enough pairs to have some possible significance. The pairs were equated for the 1928 data on the basis of chronological age, mental age, reading age, and grade status. Any pair selected showed a total variation of no more than six months in the first variables named, and not more than a year in grade in school. Thirty-two complete pairs were selected from the 1928 data. The median chronological age for the experimental group in 1928 was 11 years and 3 months; for the control group 11 years and 4 months. The difference in the medians for the mental age of the groups was two months, and for the reading age, four months.

On account of the smaller total number of cases in both groups, the 1929 data did not lend themselves to the equating of more than eighteen pairs on the basis of three variables; that is, chronological age, mental age, and grade status. No pair was selected that showed a total variation of more than one year. The median chronological age for the Dalton group was 11 years and 5 months; for the control group, 11 years and 7 months. The difference in the medians for the mental age of the groups was 3 months. In an effort to secure as many pairs as possible, the procedure in 1928 was extended to the fourth grade, from which ten individuals were selected. As the Dalton School did not include the fourth grade in 1929, and the paucity of cases did not permit the matching of any individuals in the ninth grade, the results of the second year include only grades five to eight. Table IV gives comparative averages for the two groups, so that the gross findings for both years may be seen.

TABLE IV

PAIRED COMPARISONS

MEDIANS—(Average of Grades IV, V, VI, VII, VIII)

	Reading	Composition	Spelling	Arithmetic	Average
1928 Results					
Dalton School					
Initial Grade Status	5.7	4.5	5.6	4.5	5.1
Final Grade Status	6.0	6.3	5.2	4.7	5.6
Grade Status Gain	.3	1.8	−.4	.2	.5
Control Schools					
Initial Grade Status	5.7	4.8	5.7	4.4	5.1
Final Grade Status	6.0	5.0	5.8	4.8	5.4
Grade Status Gain	.3	.2	.1	.4	.3
1929 Results					
Dalton School					
Initial Grade Status	6.4	5.4	5.5	4.4	5.4
Final Grade Status	7.7	5.3	5.6	5.1	5.9
Grade Status Gain	1.3	−.1	.1	.7	.5
Control Schools					
Initial Grade Status	7.4	6.3	5.9	4.6	6.1
Final Grade Status	7.6	6.2	6.2	5.1	6.3
Grade Status Gain	.2	−.1	.3	.5	.2

Inspection of Table IV shows that in 1928 the reading gains were identical for both groups. In composition, the Dalton group showed an outstanding gain of 1.8 grade, while the control group showed a gain of .2. The obtained difference of 1.6 grades appears a significant one as the chances are 99 in 100 in favor of this being a true difference. This is the greatest difference in any subject between the two groups. The gain in composition by the Dalton group may have been caused by the great amount of written work that is required under the Dalton Laboratory Plan. It is thus conceivable that each teacher in 1928 in each laboratory functioned rather effectively as a composition teacher in conjunction with the subject that was her specialty. In spelling, the

Dalton group lost .4 of a grade compared with the figures for the control group which showed a gain of .1. In this function the chances of a true difference are 91 in 100. The Dalton group in the first test was nearly the same in average standing as the control group, but the final showing was .6 grade below the control group. In arithmetic, the Dalton School made a gain of .2 grade as compared with a control group gain of .4 grade. The chances of this being a true difference are 88 in 100.

The average grade status gain for the Dalton group is .5 as compared with .2 for the control group, or an advantage of .3 of a grade. Marked superiority in one subject by the Dalton group is again one of the dominant factors in this result; in the 1929 instance, it was reading instead of composition. If the reading score were subtracted from the average of each school, the total result would be in favor of the control group. Twelve individuals in the Dalton group and ten in the control group showed a gain in grade status, while six in the Dalton and eight in the control group indicated a loss in grade status. In all subjects, the experimental groups made 41 gains and 21 losses, while the control groups made 35 gains and 23 losses.

The situation as presented by the use of the equated pairs indicates the following considerations to be noted:

1. The limited number of cases successfully paired discounts the value of this comparison for both years. The 1929 paired comparison is less significant than that of the previous year because of the smaller number of cases and the less rigorous equating of the pairs.

2. The outstanding advantage of the experimental group in composition in 1928 and in reading in 1929 appears to be the result of specific and local conditions in each situation, as the results are not found for both years in the case of either subject.

3. Differences in progress between the two types of schools are indicated, but these differences are not consistently in favor of either group. They suggest that outstanding superiority in any subject in either year is the result of factors other than the type of school organization.

DISCUSSION

The results of this experiment are of course difficult to interpret. There were several factors limiting the results.

1. In the first place, the number of cases in the experimental group was too small to constitute a basis for far-reaching conclusions. The larger number of cases in the 1928 findings render the comparison procedure more adequate and the results more stable than the 1929 findings.

2. The results of this work are concerned with comparative progress as shown by standardized tests. The tests used present only approximations of the functions they claim to test; and no absolute statements in regard to performance can be made except to say that only in so far as these results are showings of a given reliability and validity made on tasks in various elementary school subjects they may be considered as indications of achievement.

3. The Demonstration school may not represent a fair opportunity for the demonstration of the Dalton Laboratory Plan. The handicaps under which the school was operated may have circumscribed it to such an extent that it presented a very artificial situation. It is conceivable that the results of this experiment may present only the aspects of an educational upheaval. Just how far these assumed difficulties militated against the complete operation of the Plan can only be conjectured. It should be stated, however, that many hindrances normally present in situations where new schemes are attempted were not present in this instance. Just how far the Dalton Laboratory Plan can be held responsible for the results obtained in this experiment is difficult to state with accuracy.

In regard to relative progress made by the schools in the school subjects, the factor of intelligence must be taken into consideration. The Dalton group was the select group in both years. In the equated pair technique, an effort to balance this factor was made. In the group comparisons, no such attempt could be made. Other things being equal, it is to be assumed that the Dalton School would make more progress as a group than would the control groups. The relative failure of the Dalton group to show a central tendency that indicated consistently superior progress is the outstanding feature of the results. It is certain that if any superior results are expected from a group of children having relatively superior intelligence, these comparisons do not show that such results were achieved by the Demonstration School.

Viewing the total aspects of this experiment, it is evident that a controlled situation fails to show any consistent support for the contention that the Dalton Laboratory Plan is conducive to superior achievement in the common school branches. In fact, the indications are that the school conducted as a Demonstration School under the Plan is shown at a disadvantage in some instances when compared with the ordinary unselected city school. The fact that the results of the 1929 comparisons corroborate in a general way the findings of the 1928 comparisons seems

to give added strength to the main conclusions of this work. Differences are to be found between the results obtained in the two years, but they do not conflict with the general results.

SUMMARY

1. The experiment attempted to compare the progress of children in grades V, VI, VII, and VIII of the Demonstration School conducted by Miss Helen Parkhurst for the Ohio State University during the summer sessions of 1928-29 under the Dalton Laboratory Plan with that of the pupils in the Columbus, Ohio, public schools.

2. Progress was determined by a battery of standardized tests.

3. The initial status of the schools showed the experimental group to be younger in chronological age, superior in intelligence, and advanced in achievement in composition, spelling, arithmetic, reading and handwriting quality.

4. Group comparisons for each year indicated differences but these differences were not consistently in favor of either school.

5. Paired comparisons corroborated the findings of the group comparisons.

6. The Demonstration School situation may not have furnished an adequate opportunity for suitable comparison, and the number of cases was relatively few.

7. It appears that pupils in a school using the Dalton Laboratory Plan failed to show to advantage in the formal school functions when compared with an ordinary school system, although they were superior in ability.

INSTRUCTIONAL IMPLICATIONS FROM A STUDY OF OVERLAPPINGS IN SCIENCE

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This paper reports an investigation of the amount and nature of the overlapping that exists between courses in general science and those in biology, physics, and chemistry with a suggested plan to eliminate the reteaching which is found to be prevalent. In a previous study[1] it was shown that there is a substantial amount of overlapping between general science and physics in the high school. This study did not show, however, to what extent duplication of content is desirable from the standpoint of the effect of the repetition upon the knowledge gained. To settle this question, the present investigation has been made.

The study is divided into two parts. The first part is preliminary in character. It relates to general science and physics only, and is based upon the responses of ninety pupils in a single school. The second part relates to general science, biology, physics, and chemistry. This is based upon the responses of 2290 pupils in seventeen schools. The purpose of both studies is to determine the portion of duplicated material already known, the portion necessary to review, and the portion requiring reteaching.

THE PRELIMINARY STUDY

The pupils beginning their study of physics were given pretests involving the items duplicated in the physics textbook and the textbook in general science which they had studied. The items were divided into six groups, each corresponding to six weeks of instruction. Control and experimental groups, each of ninety pupils, were equated in terms of the I.Q.'s of the members. Both groups were taught by the same teachers. The control group carried on its study of physics in the usual way, while the experimental group received instruction as follows:

During the first three six-weeks' periods, the only mention of the pretest items to the group was by the pretests in use. The pupils used one period to review the scores on their pretest and obtain explanations of errors. During the second three six-weeks' periods the following study of the pretest materials was made by the experimental group. A

[1] Osburn, W. J. *Overlappings and Omissions in Our Courses of Study* (Bloomington: Public School Publishing Company, 1928), 167 pp.

total of six forty-five minute periods were used. During these periods the group was sectioned into sub-groups of four to six pupils for purposes of discussion. The discussion related to the items which were missed on the pretests. Page references to the textbook were supplied to each pupil. The instructor went from section to section as further explanations were needed. Each question asked was recorded. The pretests were repeated at the end of each of the six-weeks' periods. The pretests were also included in the examinations of the control group at the end of each six-weeks' period.

Comparisons of the scores of the control and experimental groups on the items of the pretests gave the following data. Items answered correctly upon the first administration of the pretests to the experimental group by seventy percent or more of the group were considered as known items, since this proficiency satisfied the standard of the school for a passing mark. Items answered upon the first administration of the pretest by fifty-five percent or more of the experimental group were answered as well at the final administration, after the review by one period given to explanation of pretest errors, by this group as by the control group after reteaching. From similar comparison it was discovered that items answered by from fifteen to fifty-five percent of the experimental group upon the first administration of the pretest were answered as well after the discussion type of review by this group as by the control group after reteaching. A consideration of the recorded lists of questions asked during review showed that seventy-six percent of these questions had been answered by less than fifteen percent of the experimental group on the first presentation of the pretests. The results of this preliminary study showed, first, that a number of items from general science duplicated in physics were known so well that the reteaching of them was not necessary, and secondly, that a large number of further items can be relearned by time saving reviews.

In light of this preliminary study the following plan was adopted for the succeeding year: Items which showed an average of fifteen to one hundred percent correct answers on the pretests were assigned as review exercises and not taken up in class. Pretest items answered by less than fifteen percent of the group were considered as new materials in the physics course. Thirty-five of the one hundred ninety-six periods given to the physics course were saved by this method in actual application. These periods were used for the introduction of new materials, mainly in an attempt to teach the scientific method and independent procedures in the laboratory.

In order to test the efficiency of the adopted plan, an objective examination which had been used two years previously by the same instructors was given. The results gave a difference in average scores under the new and the old plan of one point for groups of eighty pupils whose intelligence scores could be equated. For the entire groups, 89 pupils in the earlier and 104 in the later, the two average scores were 76 and 79, respectively.

The gratifying results obtained from this study lead to a second more inclusive experiment.

THE SECOND STUDY

In order to repeat the experiment with physics and extend it to cover biology and chemistry, a second study was made involving more than two thousand pupils in seventeen schools.

Selecting the Test Items—The writer and four assistants selected the items for the second study. The assistants were science instructors who were familiar with science textbooks. During the practice period it was found necessary to advise the assistants that the items selected must be text content and not contain inferences or generalizations that they might introduce from their knowledge of the subject. The writer and each of the assistants then itemized several passages of a general science text. The agreement of these five judges with each other is given in Table I.

TABLE I

SUMMARY OF THE AGREEMENT BETWEEN JUDGES—VALIDITY

Judges	1	2	3	4
1				
2	49/54 = 91%*			
3	49/55 = 90%	53/55 = 96%		
4	50/54 = 93%	51/54 = 94%	53/54 = 98%	
5	50/55 = 91%	50/55 = 91%	49/55 = 90%	51/55 = 93%

*The insert appearing in the above table under 1 in the vertical and after 2 in the horizontal sections of the table indicates that 49 of the 54 items taken from a passage by judge 2 were also selected from this same passage by judge 1.

At a later date, the judges repeated the itemization of a section to furnish the data for determining the reliability. The agreement with their former itemizations is given in Table II.

TABLE II

SUMMARY OF RELIABILITY

Judge 1	Judge 2	Judge 3	Judge 4	Judge 5
42/52 = 88%*	51/54 = 94%	51/55 = 93%	51/54 = 94%	50/55 = 90%

*The first insert in this table indicates that judge 1 on repeating the selection of items from a passage of text material picked 42 of the 52 items he had listed in his original itemization of this passage.

Three texts in each of the subjects, biology, physics, and chemistry, were itemized by the writer and his assistants. All items appearing in each of the three texts in the same subject were used to form an outline of the text content of biology, physics, and chemistry texts. Four general science texts were then analyzed and an outline of general science text content formed of the identical elements in the four texts. This general science outline was then checked against the biology, physics, and chemistry outlines in turn to determine the identical or overlapping items. These items appear on the pretests. The pretests were given in schools where the texts from which the pretest items were taken were in use.

Statistics:—The T-scores[2] are computed from the formula

$$50 + \frac{10\,(X - M)}{\sigma},$$

which requires the computation of M, the mean, and σ, the standard deviation from the mean. The T-scores are valuable for comparisons because (1) they are expressed in terms of the same unit, (2) they are expressed with respect to the same zero point, and (3) they are equal throughout the T-scale. For normal distributions, the standard deviation of the distribution of T-scores is 10. This places approximately two-thirds of the scores between scores 40 to 60 and the other one-third equally divided above and below the limits of this middle group.

The standard error of a percentage and the standard error of the difference are computed from the two formulas:[3]

$$(1)\ {}^{\sigma}\mathrm{p} = \sqrt{\frac{pq}{n}} \qquad (2)\ \sigma_{diff.} = \sqrt{{}^{\sigma}\mathrm{p}1^2 + {}^{\sigma}\mathrm{p}2^2}$$

Tables prepared by Edgerton[4] were found valuable in finding the standard errors of the percentages.

The Testing Program:—The three pretests were given to 1350 pupils who had completed general science and none of the advanced sciences, the general science group; the biology pretest was also administered to 250 pupils who had completed general science and biology, the biology

[2] McCall, W. A. *How to Measure in Education* (New York: The Macmillan Company, 1922), Chapter X.

[3] Yule, G. V. *An Introduction to the Theory of Statistics* (Chicago: J. B. Lippincott Company, 1924), p. 257, formula (2); p. 269, formula (6).

[4] Edgerton, H. A., and Patterson, Donald G. "Table of Standard Errors and Probable Errors of Percentages," *The Journal of Applied Psychology*, X, No. 3 (September, 1926), pp. 378-391.

group; the physics pretest to 208 pupils who had completed general science and physics, the physics group; and the chemistry pretest to 208 pupils who had completed general science and chemistry, the chemistry group. The scores of the general science group upon the pretest consisting of biology items were compared with the scores of the biology group upon these items. Like comparisons of scores were made upon the physics and chemistry pretest items. For the three comparisons, percents correct, standard errors of these percentages, and the standard error of the differences in percents were computed. Average T-scores were provided for the items of each test.

Findings.—The overlapping subject matter was classified as follows:

I. Items to be Eliminated from Advanced Science.

Class I is characterized by three conditions: (1) the T-score of the general science group must be 40 or above; (2) the T-score of the general science group must be equal to or larger than that of the advanced group; (3) the ratio of the difference of the percents correct of these two groups to the standard error of the difference must be less than three. This last requirement eliminates items upon which the advanced science group shows positive increase in learning. The T-score of 40 is used as a differentiation point, since this method applies approximately the same basis for failure of the instruction upon any item that the schools use in determining pupil failure.[3]

II. Review Items that Require no Further Instruction.

In class II are included the items that meet the following specifications: (1) the T-score of the general science group must be 40 or greater; (2) the T-score of the general science group must be equal to or larger than that of the advanced group; (3) the ratio of the difference of the percents correct to the standard error of the difference must be greater than three. This last requirement distinguishes this class of items from those of class I since there is an actual increase in learning of the items of class II in the advanced science courses. These items are to be reviewed at the beginnings of the sections of the advance science in which they occur.

III. Encyclopedic Items.

Items classed as III are of an encyclopedic nature. This type of question calls for such data as the weight of a cubic foot of water, the

[3] Data available upon 1338 pupils in the science courses of the coöperating schools show 15.2 percent failures. The T-scores below 40 approximate this percent.

number of centimeters in an inch, and the number of calories representing the latent heat of fusion of ice. Such encyclopedia knowledge is important in various practical procedures but readily forgotten. If such information is not at hand from continuous application, it is readily obtained from handbooks or like references. Since such items can be readily learned by any high-school pupil, they are to be included for review with class II because, like the items of that class, they can be left in the hands of the pupils.

IV. Review Items that Require some Further Instruction.

The items of class IV are limited as follows: (1) the T-score of the general science group must be 40 or greater; and (2) the T-score of the general science group must be less than that of the advanced science group. These items require more time for review than classes II and III above. This latter statement is based upon the fact that the T-scores show a lower relative learning of these items in general science groups than in the advanced groups. The review of these items can be left in the hands of the pupils, but assignments that locate their occurrence in the textbook should be given. The latter statement is based upon the success of application of the plan devised after the preliminary study.

V. Items to be Eliminated from General Science.

All items where the T-score is less than 40 should be excluded from the general science course. This standard for failure, as stated under class I above, is comparable to that used in the high schools. Items upon which the T-score is less than 40 furnish 84 percent of the items asked in the physics review in the preliminary experiment. This is a refinement of the percent dividing lines there erected since only 76 percent of these items were thus included. (Better teaching of these items could be advised but the classification is offered as per results shown under present instruction).

TABLE III

UNNECESSARY OVERLAPPING EXPRESSED IN NUMBER OF ITEMS PER SUBJECT

Class	Biology	Physics	Chemistry
I	25	48	10
II	90	70	58
III	2	16	10
IV	83	87	31
V	31	33	15
Total	231	254	124
Total elements in pretest	231	254	124

Table III Summarizes the Findings.—In class I are eighty-three items which are known well enough from the general science course to

require no repetition in advanced courses. There are two hundred-eighteen items in class II to be assigned for review with no need of instruction. The twenty-eight encyclopedic items are worthy of inclusion if important to the application of scientific principles. The items of class IV which are to receive consideration as review rather than the more time consuming treatment as new materials number two hundred-one. Since general science is often a required subject, the elimination of the seventy-nine items upon which general science groups fail is recommended.

CONCLUSIONS

Three major premises are drawn from the data obtained in this study:

1. In our many high schools with group instruction a more efficient selection of subject materials is provided by (a) the choice of a desired standard of mastery, (b) objective evaluation of the results of instruction, and (c) the selection of the subject materials in accordance with the results of the objective measurements.

2. The study of overlapping is worthwhile because much time can be saved by the application of the results. If the savings by review and elimination in the second study are in proportion to that determined in the first, one semester of the time now devoted to biology, physics, and chemistry in the high school could be saved by the use of the findings from the second study.

3. Any group plan of instruction based upon averages will cause some individuals to suffer. This inefficiency recommends some plan of individual instruction to provide for the greatest progress of each pupil.

INDUCTIVE vs. DOGMATIC INSTRUCTION

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Most educationists advocate the inductive or developmental procedure in the teaching of rules or general principles. Yet most classroom teachers and textbooks employ the dogmatic or telling method of presentation. The educationists convincingly explain why the inductive method of presentation *should* be superior; some of the classroom teachers reply that practically they do not feel it *is*.

In order to resolve this conflict of opinion, especially as it applies to the teaching of grammar, the following slight experiment was undertaken in the 7B grade of the Parker Junior High School, Chicago. The results are given here as a straw of evidence, but principally in the hope that others will repeat and refine the experiment until a definite decision is reached. The tentative conclusion is that the inductive method is desirable with bright classes but that with slow groups it may require more time than its effectiveness warrants.

The teaching and testing were done by Mrs. Freida Finston, a graduate of the University of Chicago and of the Chicago Normal College one-year course for junior high school teachers. She was without experience other than practice teaching. She submitted all her lesson plans and tests for the writer's criticism, but in the classroom was left entirely free. Though Mrs. Finston originally favored the inductive procedure, she took a genuinely scientific attitude toward the problem and did her very best with both methods. Her open-mindedness is shown by the fact that her own report of the experiment interpreted the results as victory for the dogmatic procedure.

The parallel-groups method of investigation seems to be inevitable in such a study. Since equivalent groups were not available, two grammatical concepts were taught, so that both methods might be used with both groups. The concept and use of the direct object occupied about ten lessons, and seven lessons were spent on the predicate nominative. To Group A, much the better class, the direct object was presented inductively; to Group B, the principle was explained by the teacher, with illustrations. With the predicate nominative these procedures were reversed. In all cases practice in application followed presentation of the principle.

Improvement was measured by means of home made pretests and check-ups, identical for both groups. In the direct-object tests a perfect score included 10 points for theory, 15 points for correct use of the direct object, and 5 points for correct use of the predicate nominative. This

last element was inserted to catch those who merely used accusative forms of all pronouns. The applications were equally divided between blank filling and error correction. Wherever possible, the initial letter of the form to be supplied in the blank space was given, *e. g.*, "It was h.... and I who journeyed....."

To save space the details of the teaching are omitted, but the lesson plans with Mrs. Finston's notations upon their execution, and the tests used are available to anyone interested.

The Statistical Results.—At first glance the verdict seems to be a draw, for the *total* improvement is about the same under both methods. Induction has conquered 25.7 percent of the ignorance of theory and dogmatic instruction has done almost as well, 23.8 percent. The slight advantage is neatly reversed on application where induction has conquered only 59 percent of the mistakes and dogmatic instruction has eliminated 62 percent.

THEORY

	Direct Object		Predicate Nominative		Total	
	Induction Group A	Deduction Group B	Induction Group B	Deduction Group A	Induction	Deduction
Pretest	1.54	0.96	2.46	2.66	4.00	3.62
Check-up	4.69	3.03	3.92	4.50	8.61	2.53
Gain	3.15	2.07	.96	1.84	4.11	3.91
Original Ignorance	8.46	9.04	7.54	7.34	16.00	16.38
Ignorance conquered	37%	25%	13%	25%	25.7%	23.8%

APPLICATION

	Direct Object		Predicate Nominative		Total	
	Induction Group A	Deduction Group B	Induction Group B	Deduction Group A	Induction	Deduction
Pretest	8.87	7.27	3.79	4.41	12.66	11.68
Check-up	13.12	11.96	9.02	10.46	22.14	21.42
Gain	4.25	4.69	5.23	6.05	9.48	10.74
Original Ignorance	6.13	7.73	10.21	9.59	16.33	17.32
Ignorance conquered	67%	61%	51%	64%	59%	62%

But the real story lies in the differing scores of the *two groups*. Dogmatic instruction seems to be about equally effective for the quick and the slow groups, 25 percent and 23 percent mastery of ignorance, 64 percent and 61 percent elimination of error. Inductive procedure, however, produced a much larger gain with the quick pupils and a smaller one for the slow pupils: in theory 37 percent for Group A and only 13 percent for Group B; in application 67 percent for Group A and only 51 percent for Group B.

Our conclusion that the inductive presentation is desirable for bright classes is tentative, quite tentative. Our prospectors' pick has indicated that there is ore here. Who will bring out the heavy mining machinery and sink a pay shaft?

THE EFFECT OF EARLY ENTRANCE UPON COLLEGE SUCCESS

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ONE of the objections offered to the acceleration of pupils in the elementary and high schools is that students who enter college much below the normal age derive less benefit from their college courses than do those who are at least approximately of normal age. Those who advance this argument frequently admit that on the whole the college students who enter under the normal age do tend to make better marks than those who are older, but claim that they do not derive the benefits from extra-class activities, social contacts, and other less easily measurable phases of college life. A somewhat different point, however, has been raised by some persons who oppose college entrance for students who are below the usual age. This is that although they make better college marks than do those who are older, their college marks when compared with their high-school marks show more of a loss than is true for older students. It is the purpose of this article to present briefly a few data which tend to refute this argument as well as a few facts which tend to support the general proposition that it is not undesirable for students to enter college at somewhat below normal age. The data to be presented were obtained from the complete high-school and college records of almost two thousand students who had attended a large number of different high schools and colleges.[1]

Although a few students in the group entered college before they were sixteen and a few others when they were twenty-two or older, it was only between these ages (from sixteen to twenty-one, inclusive) that the numbers at each age were large enough to yield reasonably reliable results. For these ages the average high-school marks, average college marks, and differences were as given in Table I. An inspection of these data shows that there is no constant trend in the difference between high-school and college marks. Apparently those who enter at seventeen or

[1] The group of students whose records are referred to is the same group as that employed in the series of studies by the writer of which the last one was published as "Predicting the Scholastic Success of College Students," *University of Illinois Bulletin*, XXVIII, No. 5, Bureau of Educational Research Bulletin No. 52 (Urbana: University of Illinois, 1930), 43 pp.

TABLE I

VERAGE HIGH-SCHOOL AND COLLEGE MARKS AND DIFFERENCES OF COLLEGE STUDENTS GROUPED BY AGE AT ENTRANCE

Age at Entrance	High-school Mark	College Mark	Differences
16	87.6	85.4	−2.2
17	86.2	84.8	−1.4
18	85.0	83.5	−1.5
19	82.9	80.8	−2.1
20	82.1	78.7	−3.4
21	81.5	83.5	+2.0

eighteen have a slight advantage over those younger or older, except for the group twenty-one years of age, the only one to earn better college than high-school marks. There were only nineteen students in this latter group, so that the result for it, although given in the table, cannot be considered to possess high reliability. The conclusion seems justified, therefore, that, on the whole, age of entrance to college is not a significant factor in the relationship between high-school marks and college marks.

Both the average high-school and college marks, again with the exception of the twenty-one-year-old group, show the well-known tendency to decrease as age increases. For the youngest group, those entering at sixteen, the averages are 87.6 and 85.4 respectively, and decrease without exception for each older group through age twenty, for which the averages are 82.1 and 78.7. The average decrease is approximately 1.5 for each increase of one year in age. The coefficient of correlation of age and high-school marks for these students was $-.20 \pm .01$, and of age with college marks $-.24 \pm .01$.

Success in college is not, however, measured merely by marks; another important factor in judging such success is persistence in college, that is, the length of time students remain there. Table II presents a few facts concerning persistence. It is evident from the figures in this table that students who enter at sixteen or seventeen years of age tend

TABLE II

MEDIAN LENGTHS OF TIME STUDENTS REMAIN IN COLLEGE AND PERCENTS OF ENTRANTS WHO COMPLETE FOUR YEAR COURSES BY AGE GROUPS

Age at Entrance	Median Number of Semesters in College	Percent Completing four years
16	5	31
17	6	32
18	4	25
19	3	21
20	3	9
21	3	9

to remain one or two semesters longer than do those who enter at the supposedly normal age of eighteen, whereas those who are still older remain on the average one semester less. Furthermore, 6 or 7 percent more of those who enter before they are eighteen complete a four-year course than is true of those who enter at eighteen, whereas of those who enter at twenty or twenty-one the percent that complete such a course is only slightly more than a third the corresponding figure for eighteen-year-old entrants.

The data presented above seem to the writer to offer no grounds whatsoever for believing that entrance to college when one or two years below normal age leads to undesirable results, but, on the other hand, suggest that students who do this maintain the higher marks which they were earning in high school and remain in college longer than do those who enter at the normal or an older age. The writer does not, however, wish to be understood as suggesting that the same condition would hold for students who were still several years younger, but instead, he would suggest that because of social and other factors only a few exceptional students should be allowed to enter college before they are sixteen. For those who are sixteen or seventeen he does not believe that the losses due to lack of social adjustment and other causes are in general sufficient to outweigh the evils of holding back individuals who are able and often eager to go ahead.

CERTAIN INTELLIGENCE ASPECTS OF A GROUP OF PHYSICALLY DISABLED PUPILS IN MINNESOTA PUBLIC SCHOOLS

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A study of physically disabled pupils in certain public schools and school systems of Minnesota was conducted in 1928-1930 under the auspices of the State Division of Re-education and Placement of Disabled Persons.[1] The disability in each instance was indicated to be of permanent nature, regardless of origin from disease, accident, or congenital cause. It was presumed also that such disability was or might become a vocational handicap. A total number of 3,261 physically disabled pupils was disclosed in a total enrollment of 362,344 pupils. The public school enrollment of Minnesota in 1928-1929 was 553,336 pupils. These 3,261 disabled pupils were found in 1,569 public school systems or units which included 1,130 ungraded elementary school units and 439 graded elementary and high-school units. The ungraded units refer, for the greater part, to one-teacher rural schools, while the graded units suggest larger school systems including three metropolitan systems, each known as a unit.

OTHER STUDIES

Fernald and Arlitt made a study of the mentality of 194 crippled children in Cincinnati, Ohio.[2] The mean intelligence quotient for these 194 cases was 82.35 with 86.53 for those crippled through nutritional disorders, and 69.11 for those crippled through spastic paralysis. Mental examination of eighty-nine non-crippled brothers and sisters in 49 families having these crippled children indicated a mean intelligence

[1] Physical disability in this study (one phase of which is discussed in this article) was judged and classified according to these general criteria:
(a) Total or partial loss or loss of use of any part or parts of the muscular and skeletal system.
(b) Total or partial loss of hearing or vision.
(c) Cardiac disability preventing physical activity.
(d) Tuberculous or other equally serious disability of the respiratory system.
(e) Unclassified physical disability of serious nature.

[2] Fernald, Mabel R., and Arlitt, Ada H. "A Psychological Study of Crippled Children of Various Types—A Preliminary Report," *School and Society*, XXI (1925), pp. 449-452.

quotient of 89.2, as compared with 83.9 for these same crippled children. While these investigators assert that "the intelligence level of this group as a whole, as judged by intelligence quotients on the Stanford-Binet, is appreciably below the average for an unselected group of children," they also admit "that the present group cannot be taken as representative of all children similarly crippled." The statement is added that the investigation was still in progress at the time of the report.

A similar study on the intelligence of crippled children was reported by Lee in Seattle, Washington, for 148 cases.[3] The mean intelligence quotient for the entire group was 86.8, indicating 92 for the poliomyelitis group and the group crippled through infections, and 61 for those crippled through congenital deformity. No study was made of siblings as reported by Fernald and Arlitt. While the investigator points out that these crippled children have an inferior intelligence, it is admitted also that such might have been the case without the physical handicap. The statement is added that "this survey does not yet prove that a diseased or injured condition influences the intelligence of the individual."

DISABLED PUPILS IN VILLAGE AND CITY SCHOOLS

Data concerning disabled pupils in the smaller graded school systems were gathered from 436 units in the study directed by the Minnesota Division of Re-education. Any facts regarding the intelligence of such pupils were obtained from school records. No tests or examinations of pupils were made during the survey. Records available indicated that intelligence data were based in most instances upon group tests. Of these, the Kuhlmann-Anderson tests had been used most frequently. On that account it seemed advisable to select only those pupils from the survey whose intelligence quotients had been obtained by these same tests. There was a total of 169 such pupils. Their chronological ages were from six to twenty inclusive.

Kuhlmann in 1928-1930 made a study of 2,590 unselected public school pupils of Minnesota in grades I-VI whose chronological ages were from seven to eleven inclusive. His findings are compared with those of this study in Table I.

The data in Table I are concerned with two groups of pupils from the same type of schools, namely, public school systems in villages and

[3] Lee, Mary V. "The Children's Orthopedic Hospital: A Survey of the Intelligence of Crippled Children," *Journal of Educational Research*, XXIII (1931), pp. 164-66.

TABLE I

DISTRIBUTION BY INTELLIGENCE QUOTIENT INTERVALS AND MENTAL GROUP CLASSIFICATIONS FOR 2,590 UNSELECTED PUBLIC SCHOOL PUPILS OF MINNESOTA IN 1928-1930 AND FOR 169 DISABLED PUPILS IN 436 PUBLIC SCHOOL SYSTEMS OF MINNESOTA IN 1929

Intelligence Quotients	Classification	Percent	
		Unselected Public School Pupils[a]	Disabled Public School Pupils
50–79	Subnormal	3.9	15.3
80–89	Dull	6.3	17.2
90–109	Normal	44.9	50.3
110–119	Superior	28.5	11.8
120 and above	Very superior	16.4	5.4
Total		100.0	100.0
Median I.Q.		108.20	96.27

[a] Kuhlmann, F. Unpublished data.

small cities of Minnesota. The comparison would appear sound from the fact that the same group test was used for both to obtain the intelligence quotients. There is a difference between the age limits of the two groups which probably would not affect the results materially for this study. The comparison is projected furthermore on the basis of certain percentages of intelligence quotients distributed among representative children as suggested by Gates.[4] The distribution by that investigator has been adapted to a classification of intelligence quotients made by Freeman.[5]

An examination of the data in Table I emphasizes certain differences between the group of disabled pupils and that of unselected pupils. There is, for example, a difference of 22.3 percent favoring the unselected group when the *subnormal* and the *dull* classes are combined, meaning that among disabled pupils these classes indicate a larger percentage. If the *superior* and the *very superior* classes are combined, then a difference of 27.7 percent is observed again favoring the unselected group, since that shows the greater percentage. In view of these findings, it is to be expected that the percentage of the *normal* class of the disabled pupils would exceed that of the unselected group. The difference in that instance is 5.4 percent.

A similar comparison is reported by the White House Conference on Child Health and Protection.[6] Public school children of Chicago for

[4] Gates, Arthur I. *Psychology for Students of Education* (New York: The Macmillan Co., 1924), p. 435.

[5] Freeman, Frank N. *Mental Tests* (Boston: Houghton Mifflin Co., 1926), p. 100.

[6] White House Conference on Child Health and Protection, *Special Education: The Handicapped and the Gifted* (New York: The Century Company, 1931), p. 70.

the number of 1,119 pupils were compared with 1,919 crippled children in public schools of five mid-western cities including Chicago. A difference of 8.8 percent favored the physically normal children with respect to the *mentally subnormal* and *dull* classification. The difference between the two groups of pupils for the *superior* and *very superior* classification did not exceed 0.6 percent. *Normal* mentality favored the physically normal children by 9.1 percent.

SUMMARY

The studies indicated here do not warrant the conclusion that disabled pupils as a whole are mentally inferior to the non-disabled. The fact that the Minnesota study is concerned with several types of disabled pupils, whereas the studies reported from elsewhere indicate crippled children only, would have probable significance with a larger number of cases. The apparent mental disadvantage which the disabled have when compared with unselected groups is probably due to the lower intelligence of those whose disablement involves the central nervous system, and it may be that such disadvantage is due to some cause other than physical disablement. The mental status of disabled pupils, so far as known, may be fairly comparable to that of the non-disabled. These studies may be acceptable in suggesting future effort to ascertain what relation if any exists between physical disability and mental capacity. In so far as that aim is stimulated through studies like these, then they are useful.

A STUDY OF TEACHING APTITUDE[1]

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How to select from all available candidates those who are most likely to become good teachers is one of the chief problems for teacher training institutions of the future. Professional schools are recognizing this fact, and have already introduced various "selective" plans.

One of the devices receiving attention in recent years is the prognosis or aptitude test. Several have been developed but apparently none have had sufficient validity for practical purposes.

A study was recently carried out at West Virginia University in an attempt to estimate the prognostic value of one of these tests.[2] The data forming the basis of the study were obtained from one hundred thirty-five senior and graduate students in the College of Education. The tests were administered during January and February, 1931.

The Coxe-Orleans Test is one of the most extensive prognosis tests yet devised, taking approximately three and one-half hours gross time to administer. The tests consist of five parts:

Part I. Seventy-eight questions on general information.

Part II. A true-false test of professional interest, containing one hundred questions.

Part III. "Lessons in Education," including eight sub-tests involving problems with the median, interpretation of a handwriting scale, scoring of test papers, and the interpretation of educational situations in the light of listed paragraphs on educational science.

Part IV. A test of reading comprehension.

Part V. Problems in education on which the examinee passes judgment.

The criterion of teaching efficiency against which the data obtained in this study are correlated consists of the supervisors' ratings of teaching ability at the close of the practice-teaching period. These were avail-

[1] The writer was assisted in most of the statistical work of this study by Buren H. Toler, Francis Freshwater, Alma Ayers and Russel Curtis. The entire study was conducted under the direction of Drs. John E. Bohan and L. B. Hill of the College of Education, West Virginia University.

[2] The Coxe-Orleans Prognosis Test of Teaching Ability, developed under the direction of Drs. Warren W. Coxe and Jacob S. Orleans of the New York State Education Department, and copyrighted in 1930 by the World Book Company, Yonkers, New York.

able for ninety teachers by the last of May. The data from these ninety students form the basis of this study.

Supervisor ratings were first made on a seven-point graphic rating sheet, embracing the following factors: (1) scholarship, (2) social qualities, (3) industry, (4) initiative and resourcefulness, (5) professional attitude, (6) class control, and (7) teaching success or achievement in actual classroom teaching. With this sheet before him the supervisor rated the teacher 1, 2, 3, 4, or 5, as to her probable success as a teacher.

In order to determine the reliability of these ratings, seven of the nine supervisors re-rated sixty-three of the same teachers five months later, October, 1931. The two ratings correlated +.934. Inasmuch as the two supervisors not participating in the re-rating were individuals with at least average supervisory experience, it seems reasonable to assume that their re-ratings would not have changed the results materially.

The average scholarship marks of these ninety students were obtained from the registrar's office at the University. Not all students had been in the University for the same length of time but University scholarship marks were available for three or more semesters' work for all but two students. These two were in their first year of residence.

TABLE I

RANGE, MEDIAN, AND STANDARD DEVIATION OF THE PROGNOSIS TEST RAW SCORE, PROGNOSIS TEST WEIGHTED SCORE, SUPERVISORS' RATINGS, AVERAGE SCHOLARSHIP

	Range	Median	Standard Deviation
Prognosis Test Raw Score	204-370	304.8	34.75
Prognosis Test Weighted Score	2173-3999	3310	372.34
Supervisors' Ratings	1-5	3.22	1.24
Average Scholarship	71-94.5	83.37	4.72

After the prognosis tests were scored by staff members of the College of Education they were carefully checked for errors in scoring before any correlations were calculated.

All intercorrelations were determined by the Pearson Product-Moment formula. A summary of the zero order correlations is given in Table II.

TABLE II

ZERO ORDER CORRELATIONS

	r	PEr
Weighted score and raw score	+.91	.01
Weighted score and supervisors' ratings	+.39	.06
Weighted score and scholarship	+.50	.053
Raw score and supervisors' rating	+.425	.058
Raw score and scholarship	+.636	.042
Supervisors' ratings and scholarship	+.35	.062

Scholarship and supervisors' ratings both have a higher correlation with the raw score than with the weighted score. The correlation between supervisors' ratings and scholarship is slightly lower than the rest of the series.

The correlations of the first order are given in Table III.

TABLE III

CORRELATIONS OF THE FIRST ORDER (1-WEIGHTED SCORE ON TEST, 2-RAW SCORE, 3-SUPERVISORS' RATINGS, 4-SCHOLARSHIP)

$r_{13.4} = +.266$	$r_{23.4} = +.28$
$r_{14.3} = +.42$	$r_{24.3} = +.57$
$r_{34.1} = +.19$	$r_{34.2} = +.128$

The correlations of prognosis test score with scholarship are higher than with the supervisors' ratings. From the basis on which the Coxe-Orleans test was formulated this is to be expected. The significant correlation of .57 between raw score and scholarship, however, leaves a question as to the desirability of the weighting method.

While there is a minimum scholarship requirement for admittance to practice teaching, this requirement does not usually exclude more than seven percent of the applicants. During the period for which this study was made less than 6 percent of the applicants were thus excluded. The requirements provide that no student be admitted below senior standing and none with an average scholarship of less than 80 percent in their teaching field.

The data presented by the supervisors' ratings indicate that scholarship is a minor factor in forecasting teaching success. The study does not attempt to indicate what other factors are operative. If the prognosis test, however, is devised to measure factors of teaching success, other than scholarship, it seems reasonable to expect a higher correlation with the supervisors' ratings than was the case in this study.

On the other hand, if the prognosis test is supposed to measure the same factors as does scholarship, two questions arise: First, is not the raw score a better index than is the weighted score? Second, are not the average class marks a better index of ability than are the test scores?

The authors of the prognosis test indicate that their test has a high correlation with "achievement in first-year work of the teacher-training institution, which ordinarily includes little professional work."[3]

[3] Coxe, Warren W., and Orleans, Jacob S. *Coxe-Orleans Prognosis Test of Teaching Ability, Manual of Directions* (Yonkers-on-Hudson, New York: World Book Company), 3 pp.

They further indicate that the Prognosis Test is devised to measure the student's "knowledge of teaching methods and practices as acquired from his observations as a student, and his ability to master professional material in the educational field."[4]

Yet in this study the part of the test which has the most significant correlation with weighted score, r = +.65, is Part I, which deals with general information.

In determining the weighted score, the authors of the test assign the following weights to the different parts of the test: Part I, 20; Part II, 10; Part III, 12; Part IV, 1; Part V, 10. These weights seem unwarranted by the results of this study.

An examination of the scores on the different sections of the test reveals a decided lack of uniformity of correlations between the scores and the other factors of scholarship and supervisors' ratings. These correlations are given in Table IV.

TABLE IV

CORRELATIONS OF THE SCORES ON THE SEVERAL SECTIONS OF THE PROGNOSIS TEST WITH SUPERVISORS' RATINGS AND WITH SCHOLARSHIP

Factor	Correlation with Supervisors' Ratings	Correlation with Scholarship
	r	r
Score, Part I	+.126	+.40
Score, Part II	+.454	+.36
Score, Part III	+.28	+.29
Score, Part IV	+.19	+.55
Score, Part V	+.06	+.32

A comparison of the correlations of the different parts of the test indicates that Part I has been unduly weighted. While Part I has an insignificant correlation with supervisors' ratings, it does have a correlation of +.40 with scholarship. Part II is the only section of the test which has a higher correlation with supervisors' ratings than with the factor of scholarship.

This study has attempted to determine the relationship between the Coxe-Orleans Prognosis Test scores, supervisors' ratings, and scholarship of ninety practice teachers.

While it is impossible to draw final conclusions from this limited study, the data indicate that the Prognosis Test measures the qualities related to general scholarship as evidenced by school marks, rather than other factors contributing to teaching success as revealed by supervisors' ratings of practice teaching.

[4] *Ibid.*, p. 2.

The prognosis test score has a higher correlation with scholarship than with the supervisors' ratings. The prognosis test raw score correlates higher than the weighted score with both scholarship and supervisors' ratings.

The various sections of the test do not show correlations with the other criteria in proportion to the weighting given by the authors in determining the final score.

While any attempt to improve the technique of prognosis is to be commended, all such tests should be carefully validated before being placed on the market.

SPEED AS A FACTOR WITH CHILDREN OF SUPERIOR AND INFERIOR INTELLIGENCE

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MANY attacks have been made on the validity of modern tests by educators and laymen who contend that the setting of definite time limits severely handicaps many individuals who are innately "slower-rated" than others. They contend that if these persons were allowed more time, their scores on any given test could be materially increased. But suppose that this occurs. Of what significance is it in the final analysis of results? We must bear in mind that "scores in intelligence tests or educational tests possess meaning only in reference to the norms of performance established for the particular test."[1] These norms are usually averages, medians, percentiles, standard deviations,[2] or some other measures derived from these, so that complete removal of time limits would tend only to invalidate the norms of most existing tests. The question to consider first is: do the norms established on limited time become invalid when the time element is eliminated?

According to Ruch, if the correlation between scores earned in single time and those earned in unlimited time is found to be as high as 0.95 to 0.99, especially if it is as high as, or higher than, 0.98, there would be little practical justification for greatly increased time allowance. Table I shows the correlations between single and unlimited time scores in the Reading Tests I, II, and III, of Forms A and B of the Stanford Achievement Tests. These results were obtained from the tests given the low seventh grade in the junior-high-school department of the Oakland High School.

We may conclude from Table I that, taking the whole group into consideration, the time limits used in the Stanford Achievement Tests, as they have been set, do not invalidate the tests, since they are, for all practical purposes, *power* tests as administered. As the reliability coefficient of the Reading Tests of the Stanford Achievement Tests is 0.95, it is probable that these correlations approach unity about as closely as the reliabilities of the test permit.

[1] Ruch, G. M. "The Speed Factor in Measurement," *Journal of Educational Research*, IX (January, 1924), p. 38.

[2] Ruch, G. M., and Stoddard, George D. *Tests and Measurements in High School Instruction* (Yonkers, New York: World Book Company, 1927), p. 60.

TABLE I

CORRELATIONS BETWEEN SCORES EARNED IN SINGLE AND UNLIMITED TIME FOR THE READING TESTS OF THE STANFORD ACHIEVEMENT TEST (FORMS A AND B)

Form A

Test	r	P.E.	Standard Deviations		N
			Single	Unlimited	
I	.980	.0022	13.5	13.1	150
II	.982	.0020	13.5	13.6	150
III	.988	.0013	10.7	10.4	150
Composite Reading	.980	.0022	34.0	32.0	150

Form B

Test	r	P.E.	Standard Deviations		N
			Single	Unlimited	
I	.987	.0014	11.1	11.6	162
II	.991	.0009	13.2	13.4	162
III	.963	.0043	9.1	10.2	162
Composite Reading	.975	.0026	34.0	32.2	162

The next question which is presented for consideration is: Are there any significant differences in the behavior of scores obtained from those pupils rated as 'superior' and those rated 'low' on standard intelligence tests? In an attempt to answer this question, a study was made of the five different ability groups as classified at the Oakland High School. The National Intelligence Test and the Otis Group Intelligence Scale had been used as a basis for making this classification. Although there was some overlapping of intelligence quotients within the three middle groups, the two extreme groups, with which we are the most concerned, were fairly well defined. The range of Group I was from 110 to 159 I.Q.; that of Group V, from 42 to 95. Table II gives the results of correlating the single and unlimited time scores of the five different groups.

TABLE II

CORRELATIONS BETWEEN SCORES EARNED IN SINGLE AND UNLIMITED TIME FOR THE READING TESTS OF THE STANFORD ACHIEVEMENT TEST

Form A

Ability Group	r	P.E.	Standard Deviations		N
			Single	Unlimited	
I	.997	.0010	26.0	26.0	37
II	.993	.0010	20.6	20.5	32
III	.988	.0027	23.0	23.2	36
IV	.975	.0063	23.9	22.8	29
V	.960	.0119	24.8	23.6	21

Form B

Ability Group	r	P.E.	Standard Deviations		N
			Single	Unlimited	
I	1.00	.0000	26.0	26.0	40
II	0.995	.0088	18.7	19.9	36
III	0.988	.0027	23.6	22.8	37
IV	0.974	.0064	24.0	22.9	29
V	0.962	.0110	24.6	23.0	22

This table indicates that there was some difference in the behavior of the scores obtained from the superior group and those obtained from the low group. The correlation coefficient on both forms of the tests for the superior group was practically 1.00, indicating a perfect correlation. From this value the coefficients decrease gradually and reach their lowest point with Group V.

Inspection of the data shows that there is a considerable shifting about of scores for the low group, while those of the superior group exhibit a high degree of stability; that is, in the latter case, the scores earned on single time are, in almost every instance, the same as those earned on unlimited time. In contrast, the scores of the low group show a decided upward trend in size from single to unlimited time.

CONCLUSIONS

Taking the total group into consideration, we may conclude that the time limits as they have been set on the Reading Tests of the Stanford Achievement Test are ample and that complete removal of these time limits would not materially affect the validity of the scores obtained.

When the group's intelligence, however, as measured by standard intelligence tests, is taken into consideration, and the total group is divided on this basis into five different ability groups, the behavior of the scores of the superior group seem to be somewhat different from those of the low group. Although the data at hand are insufficient to warrant drawing any general conclusions, the evidence seems to indicate (1) that the superior pupils reach their maximum scores on the test under the time limits fixed, (2) that pupils with low intelligence quotients do not reach their maximum score within the assigned limits of time.

THE INTERVIEW IN TEACHER SELECTION

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PROBABLY the most important single responsibility of the public school principal or superintendent is the selection of teachers. The technique employed is rather well standardized. An applicant is usually asked to submit both a record of his academic achievements and a list of references. These latter are, in due course of time, requested to render a written estimate of the applicant's fitness for the particular opening available. This type of procedure usually constitutes the first "hurdle." If the individual being considered for the teaching position has a satisfactory academic record, and if he has been able to impress his friends favorably enough for them to recommend him highly, he is ready for the next step in the selective process. He is interviewed.

Most of us have a great deal of faith in the interview. As a result of years of practice, we believe that there is no way to become acquainted with an individual quite so satisfactorily as by visiting with him for a time. We pride ourselves on recognizing quickly certain so-called *symptoms*, or signs of character, such as a firm hand shake, a strong jaw, a kindly expression, a high forehead, artistic hands, or well separated eyes.[1] Largely on the basis of these impressions, which are about all in the way of new information that the interview furnishes, we make our final selection.

The prevalence of this practice of making the interview the acid test of the applicant's fitness for the job has sufficed to direct considerable attention to it.[2] Most of the experimental studies, such as the oft-quoted observations by Hollingworth,[3] are concerned with the reliability and validity of the interview. In Hollingworth's report 57 applicants for sales positions were interviewed by 12 sales managers. Each candidate was assigned a rank of from one to 57 by each judge, rank one meaning

[1] Such beliefs persist despite much experimental evidence to the contrary. See, Hull, C. L. *Aptitude Testing*, Yonkers-on-Hudson, New York: World Book Company, 1928.
Paterson, D. *Physique and Intellect*, New York: The Century Company, 1931.

[2] See, Bingham, W. V., and Moore, B. V. *How to Interview*, New York: Harper and Company, 1931.

[3] Hollingworth, H. L. *Judging Human Character* (New York: D. Appleton and Company, 1923), p. 65ff.

that an individual was best fitted for the position, and rank 57 that he had the poorest qualifications of anyone in the group. There was marked disagreement among the judges. To illustrate, one applicant was ranked 6 by one judge and 56 by another. Hollingworth concluded that the personal sizing up of candidates in an interview is very unreliable. Most of the evidence since Hollingworth's study has been more or less controversial. Recent emphasis has been upon an improvement of interviewing techniques,[4] the importance of which is obvious when one recognizes that the sole value of the interview is in the opportunity it provides to have the subject report his past behavior and illustrate his present attitudes *correctly*. Certain writers,[5] however, have continued to call our attention to the basic value of data derived from the interview.

The present study concerns itself with this latter problem, by attempting to determine, under experimental conditions and with the use of modern methods, how reliable and valid the interview can become under optimal conditions. This was made possible by training eight advanced psychology students in the methods of estimating aptitudes from an interview. They were instructed with respect to the most common errors entering into judgments of this type, advised as to the kind of questions to ask, and told particularly to be on their guard with respect to the so-called "halo"[6] effect. After some days spent discussing and reading about the interview in general, arrangements were made to have these eight selected students interview eight girls, all strangers, and rank them in accordance with the degree in which each possessed the following traits: *neatness, conceit, sociability, humor, intelligence, refinement*, and *beauty*.

In order that the interviewers might evaluate most objectively, detailed directions, including a rating sheet, were given to each, with in-

[4] Kreeland, N. "The Interview in Training Salespeople," *Personnel Journal*, VIII (1929), pp. 47-52.

O'Rourke, L. J. "Measuring Judgment and Resourcefulness," *Personal Journal*, VII (1929), pp. 427-440.

[5] Moriwoki, E. "Note on the Comparative Validities of Judgments of Intelligence Based on Photographs and Interviews," *Journal of Applied Psychology*, XIII (1929), p. 630ff.

Clark, E. L. "Value of Student Interviews," *Personnel Journal*, V (1927), pp. 264-7.

[6] A name given to the tendency to rate an individual highly in all traits merely because he evidences unusual development along one particular line. For example, we are often misled into concluding that a person has intelligence, character, and general charm merely because he has mastered well certain of the social graces summed up by the word *courtesy*. See: Thorndike, E. L. "A Constant Error in Psychological Ratings," *Journal of Applied Psychology*, IV (1920), p. 25ff.

structions to indicate on a scale, ranging from high to low, the proper location for each of the persons interviewed. These rating sheets were carefully constructed and contained descriptions of the traits to be evaluated, as well as indications as to what should be considered a definite amount of each trait. The first, *neatness*, was followed with the definitive comment, "Dress, hair, hands, make-up, are they neat and in order? Do they show evidence of care?" Thus oriented, the interviewer was to locate each girl some place on a scale marked by the following extremes: "Slovenly and untidy in general; dirty hands, smeared make-up, untidy dress and hair," or at the other extreme, "All matters of personal appearance as neat as possible." The second trait, *conceit*, was defined as, "'No one as good as I' attitude; thinks very highly of her own personal characteristics and achievements; associates only with her own cliques and clubs." The other five characteristics were similarly defined and, in so far as possible, made quantitative.

These rating sheets served to guarantee that the judgments of the interviewers would be at least *more* reliable than is usually the case when no such precautions are employed. The students making the judgments were on the lookout for certain traits only, these were defined before them throughout the interview, and they were instructed to rate each girl without delay as soon as the interview was completed. The interviews were ten minutes in length.

In order to determine whether any one of the interviewers was accurate in his judgment, it was necessary to establish some *true* measure of the traits in question. Just as you might check the accuracy of an individual's estimate as to the length of a room by comparing it with a carefully measured or true length, so an attempt was made to evaluate each interviewer's judgment by checking it against a *true* measure of the personality traits of the girl observed. This "true" measure was obtained after the manner of Hollingworth,[7] McCabe,[8] and others, by having each of the 8 girls ranked according to the traits we were studying by a group of 12 of her intimate friends. This was made possible by selecting the girls to be interviewed from one sorority, and having 12 upperclass women in the same house pass careful judgment upon each.

The question naturally arises, what evidence is there that even these judgments of close friends were reliable? In addition to the common

[7] Hollingworth, H. L. *Vocational Psychology* (New York: D. Appleton and Company, 1916), p. 308.

[8] McCabe, Florence E. Quoted in Hull, Clark L. *Aptitude Testing* (Yonkers on Hudson, New York: World Book Company, 1928), p. 115ff.

sense argument that the best way to know a girl's true personality is by living and eating with her, we used certain statistical procedures which clearly indicated that the judgments were quite accurate. Chief of these was a comparison of the rankings given any girl for a particular trait by different ones of her friends. If these friends agreed closely in their opinions, it would seem evident that they had observed the same behavior characteristics, and that these characteristics were rather constant. For example, if, with respect to neatness, one particular girl were given a rank of first by 10 of her 12 friends, and a rank of second by the other 2, it would appear that she, without doubt, and in so far as any observation could determine, was the neatest of the group. The agreement was not quite this close in every case, but it was sufficient to indicate to us that we had obtained at least a *good* criterion measure. For example, one young woman was given the following ranks with respect to sociability—2, 1, 1, 2, 1, 1, 2, 2, 1, 1, 2, and 1. Another was judged 6, 6, 7, 8, 8, 8, 7, 8, 8, 7, 8, 7 with respect to intelligence. When correlations were computed between the pooled judgments of one group of six judges against another group of six, the magnitudes all exceeded a positive .80. This rather great agreement among the intimate friends was more or less expected, for similar results have been reported frequently. To get the true status of any girl we combined the opinions of all judges, by averaging ranks.

After a determination of these true or criteria measures, comparisons were made between them and the estimates of the different interviewers. These are presented in Table I which gives the true rank for each girl as well as the extreme ranks given by the interviewers. These *actual ranges* are more enlightening than correlations, because as the interview is used, particularly in the placement of teachers, opinions are very infrequently pooled. It is the judgment of the individual interviewer which is depended upon. Table I makes quite obvious the fact that interviewers are at odds with one another and cannot agree with a valid criterion. The following conclusion seems warranted: if intimate friends *are* well acquainted, and if they *can* judge the traits of one another accurately, then strangers, making judgments on the basis of an interview, cannot. Of course, certain interviewers made correct judgments on particular traits, for particular girls, but this was not done consistently and was largely a matter of chance.

TABLE I

RANGE OF RANKS GIVEN EIGHT GIRLS ON SEVEN TRAITS BY EIGHT INTERVIEWERS

Neatness			Conceit		
Girl	True rank	Range	Girl	True rank	Range
A	5	1-8	A	7	2-7
B	6	3-7	B	8	3-8
C	4	2-8	C	4	2-6
D	3	1-4	D	1	1-6
E	8	1-8	E	6	3-8
F	2	1-8	F	2	3-6
G	1	1-6	G	5	1-7
H	7	1-6	H	3	1-8

Sociability			Humor		
Girl	True rank	Range	Girl	True rank	Range
A	8	2-7	A	7	1-6
B	6	3-8	B	6	2-7
C	3	2-6	C	2	1-8
D	2	1-6	D	3	1-7
E	5	3-8	E	8	1-8
F	7	3-6	F	5	2-7
G	4	1-7	G	4	1-8
H	1	1-8	H	1	1-8

Intelligence			Refinement		
Girl	True rank	Range	Girl	True rank	Range
A	8	2-8	A	6	1-8
B	7	2-7	B	4	2-8
C	2	1-8	C	5	1-8
D	3	1-6	D	1	1-7
E	6	1-8	E	8	1-8
F	4	2-8	F	7	2-7
G	5	3-8	G	3	1-5
H	1	1-8	H	2	1-8

Beauty		
Girl	True rank	Range
A	6	1-7
B	4	2-7
C	5	2-6
D	1	1-8
E	8	1-8
F	7	3-7
G	3	1-8
H	2	2-7

An obvious criticism of the technique employed in this study is that the school situation is different. Although many administrators interview a number of candidates within a short period, say one afternoon, it quite infrequently happens that one person is interviewed eight times within an equal interval. While it is conceivable that this succession of interviews might be responsible for the change in rank on the part of particular girls, such was actually not the case. There was no tendency for a person's ranking to vary constantly according to the number of times she had been interviewed. Furthermore, the circumstances of this study differ from those in the actual school situation, because public

school men are not forced to select teachers on the basis of an interview alone. They have, in addition, the written references.

Anyone who has been asked time and again to render on a rating scale a judgment about an individual's character or personality, realizes how reluctantly he places his opinions in writing. College instructors are frequently asked to give an estimate of such subtle and complex characteristics as resourcefulness, tolerance, punctuality, ambition, industry, tact, and foresight. And even more ridiculous, they do it, frequently on the basis of a semester's acquaintance, rather than take the chance of jeopardizing some boy's chances by refusing to recommend him.

If it is impossible, and such seems to be the case, to judge accurately of an individual's aptitude for teaching by means of either an interview or the traditional reference, what can the public school man do? There is one procedure which, while not novel, has at least been used very rarely. This method of selecting teachers would involve interviewing the person submitting the references, in addition to interviewing the applicant. The fact that an applicant submits the name of a particular person for a recommendation is guarantee of nothing more than acquaintance, sometimes not even that, and the statements of a mere acquaintance about teaching aptitude are practically worthless. The first task of the principal should be to determine which ones of the persons submitted as references are actually acquainted well enough with the applicant to pass upon his fitness. This could easily be accomplished by correspondence, and arrangements made for personal conferences. In other words, as this experiment has indicated, a much more accurate conception of young John Brown's teaching aptitude can be obtained through consultation with his qualified friends than by interviewing him.

It is not intended that these interviews should take the place of personal conferences with prospective teachers. Few administrators would care to employ a teacher whom they had not seen. The personal interview does have some value; at least one can find out how the applicant acts when being interviewed, and that is an item. But for information on which to base an estimate of true worth and teaching aptitude it is better to counsel with those who know an applicant intimately than to visit with the applicant himself. This holds for a number of reasons. First, experimental evidence has clearly demonstrated that it is impossible to judge character and personality traits by means of an interview. In the second place, the interview is not fair to the candidate. The situation itself is unique and quite apt to so affect the one interviewed that

he gives a decidedly erroneous opinion of his worth. The third reason in favor of actually interviewing the men submitting the references is that much more reliable information can be thus obtained than by the use of the customary rating schedules sent by mail. To those who have filled in many of these schedules little comment here is needed. It is done in a purely perfunctory manner, and in addition, too many statements as to a person's ability have fallen into the wrong hands to permit perfect candidness in written communications. But, if an interested party such as a school superintendent were to speak frankly of his position and ask confidentially for an evaluation of someone whose capacities another was in a position to pass judgment upon, most of us would gladly give our honest convictions, pro or con, and in detail.

The two chief objections to such a plan are, first, it would take more time, and second, it would involve a larger expenditure of money. Within rather wide limits neither claim, though probably true, should carry weight. If in this way one out of every four mistakes in the placement of teachers could be eliminated the result would be worth many times the cost; and over a period of years, because of a resultant smaller teacher turnover, the expense item might probably be considerably reduced.

EDITORIALS

RESEARCH DIRECTED TOWARD CONSTRUCTIVE EDUCATIONAL PROGRESS—AN AID TO PUBLIC UNDERSTANDING AND SUPPORT

EDUCATIONAL research, in the modern use of the term, has now been active for a period of approximately twenty-five years. A major portion of the work that has been done has been in the elementary school field. Anyone who examines the reports found in our educational journals and the popular newspapers and magazines partly based upon this research will be impressed by the large number of faults revealed and deficiencies discovered. In other words, the efforts of the research workers, so far as these results are portrayed in the literature of the past two decades, would suggest that research has been mostly concerned with finding fault.

One cannot help but wonder to what extent the present difficulties of the schools are a direct result of this activity. Have we not undermined the confidence of the public in the efficiency of our school system during these years to such an extent that now, when economic conditions result in lowered funds for all purposes, the schools are receiving larger cuts than other services and the people in general are questioning the worth of the educational activity which has been carried on? It is a well-known principle in advertising that if we tell people a thing often enough they will believe it and react accordingly. We have been telling the people rather continuously for two decades that the results in reading, writing, spelling, arithmetic, history, geography, language, etc., are poor. It is little wonder that the present generation of tax payers, who have a glorified memory of the schools of their youth and who remember the outstanding pupil at the spelling matches, should be unconcerned, if not actually hostile, to maintaining school revenues in the face of decreased personal income.

Likewise, one cannot help but wonder what the reaction of the public would be today if at least one-half of the time, money, and energy expended in educational research during this quarter century had been expended upon the discovery of techniques for improving the quality

of instruction and procedures by which the materials of instruction and the training of teachers could have been improved. That much work has been done in this line is certainly true, but the news which has been given to the public has rather consistently tended to emphasize the other side of the picture.

There seems to be about as much greed in the world today as ever before. Perhaps our periods of enlarged income and easy fortune from 1914 to 1929 tended to develop greed and glorify material getting. Ignorance of certain basic truths of economics, sociology, psychology, and philosophy are likewise fairly dominant.

The work of the schools must be two-fold: the education of children within their charge; and the education of the total public to the significance of proper education and the worth of the work which the schools are doing. Educational research should contribute tremendously to both of these functions. It can so contribute, however, only if as much or more emphasis is placed upon constructive things as upon the revelation of deficiencies.

E. J. Ashbaugh

REVIEWS

Address all communications relative to book reviews to Kai Jensen, Assistant Professor of Education, University of Wisconsin, Madison, Wisconsin.

MacNeel, Joseph Raymond, *Admission of Students as Candidates for Master's Degree*. New York: Bureau of Publications, Teachers College, Columbia University.

This monograph is a record of the "study of some problems encountered in the admission of students for the degree of Master of Arts, Teachers College, Columbia University." As stated in the introductory chapter, the author's purpose was five-fold:

1. To determine the relative effectiveness of various types of undergraduate preparation for graduate work in education at Columbia University.

2. To study the records made at undergraduate institutions, and at Teachers College, by five hundred and nine persons who received the degree of Master of Arts from Columbia University during the years 1928-29 and 1929-30.

3. To determine the relationship between certain items in these records and success at Teachers College.

4. To determine whether the results of such comparisons can be used in predicting degrees of success in graduate work in education.

5. To make recommendations regarding the admission to graduate work in education at Columbia University of candidates for the degree of Master of Arts.

Sixty-eight pages are used for the six chapters in which the author makes observations and comparisons and draws conclusions from many factors in the records of the five hundred and nine students selected from all those who received the Master of Arts degree from Teachers College during the years 1928-29 and 1929-30. These students were chosen from those whose average grades fell above the upper or below the lower quartile of all recipients of the Masters Degree at Teachers College.

The records of these students were studied as to: graduate average grades; undergraduate average grades; general examination score; age of student; elapsed years between graduation from college and the time of receiving the degree of Master of Arts; number of points in education taken in undergraduate work; number of undergraduate institutions attended; kinds of colleges from which Bachelor degree was received; major pursued in undergraduate institutions; and changing majors or continuing with same majors.

So few of the results obtained from this study are distinctive enough to have statistical significance that it is doubtful whether the monograph has great value for any institution aside from Teachers College, Columbia University. The author feels that the following points do have significance:

1. Students from city colleges and negro schools "did a significantly lower quality of work at the graduate school of education."

2. The fact that older students made better grades in graduate work than the younger ones did "leads to the conclusion that experience and maturity are significant factors contributing to success in a graduate school of education."

3. The fact that students from liberal arts colleges made significantly higher scores on the "general examination" than did those from teachers colleges points to the conclusion that the liberal arts colleges select students who seem somewhat more intelligent and of better social and economic background than those attending the teachers colleges.

4. "Instructors at teachers colleges seem to give relatively high grades to undergraduate students."

5. The fact that forty-two percent of the cases studied changed majors seems to indicate a need for better vocational guidance in undergraduate institutions.

Among his conclusions the author states that "admission problems are, and probably will remain, individual in nature" because of the difficulty of discovering mass criteria for predicting the future status of the candidates. We need to know many more facts about each individual applicant than we now require, such as social background, economic status, and degree of success attained in teaching.

If one could place beside this study a similar one of those who failed to get their degree after study at Teachers College, Columbia University, and those who, having graduated, failed as teachers, he might work on admission problems with greater assurance than is now possible. Mr. MacNeel's contribution takes us part of the way, and should be examined by administrative officers and faculty members of teachers colleges and of departments of education, for the data which it contains and for incentives to further work on the problems encountered in the admission of students to graduate study.

CLAUDE E. PALMER
Ball State Teachers College

HUNTER, EARLE L. *A Sociological Analysis of Certain Types of Patriotism: A Study of Certain Patriotic Attitudes, Particularly as These Appear in Peace-Time Controversies in the United States.* New York (1932), pp. 263.

The author attempts to reduce the uncritical confusion surrounding the concept of patriotism. He arrives at about the same conclusions many other analysts have arrived at with far less work. He has knocked down a straw man. Most students and intelligent laymen have long believed what Hunter's study tries to demonstrate and those who do not will probably continue in the "error of their ways" even if they should chance to read this essay.

Briefly, this is the method used. References to the working definition of patriotism (loyalty to country as a whole) were read in fourteen to twenty-eight newspapers in connection with four peace-time crisis situations on the theory that people express their "real attitudes" under such conditions. We are not told why these particular papers were selected, nor why the same papers were not used for all four crises, nor how many statements were collected. Apparently, no criteria of selection were used. Statements of editors, newswriters, correspondents and special writers were taken indiscriminately and all given the same weight, the only requirement being that they should express an "attitude" toward "patriotism" as tentatively defined. And, of course, the author

himself was the only judge of whether the selected statements expressed an "attitude," and if so, what. Then the "attitudes" were classified and reclassified until six "types" were finally determined. These are: State Supremacy, Institutional Loyalty, National Egocentrism, Eclectic Institutional Loyalty, Critical Mindedness toward the State, and National Self Sufficiency. Correlation was used to "describe connection between these types of behavior and the conditions of social life" (p. 41) but nothing is said about the nature of these correlations or the methods of getting them.

The general conclusion is that loyalties are only to specific ends and to specific aspects of country, not to the state as an abstract entity (p. 23). "This orientation of loyalty is described more accurately as communalism than by the familiar term patriotism...Communalism...is the use of the general welfare of the community for criticizing and for rationalizing ever and anew the many specific loyalties of social life that they may function in accordance with interests of the welfare of the broadest community involved in their operation" (p. 25). This is the redefinition of patriotism.

Some pertinent (or impertinent) questions: Would other investigators using this method, arrive at the same six "types" (if they are types), even if they started with the same "concrete data" (if they are concrete)? How many of the statements would other investigators collect from the same papers? How nearly would they agree with the author's opinion as to what "attitudes" such statements reflect? Would they arrive at the same conclusions or derive the same "hypotheses" from them? What are the "attitudes" of the writers of the opinions collected? Would they, or do they, *act* as their statements imply? How widely held are the six "typical" concepts of patriotism, *i. e.*, are they really typical? Does the "ideal" definition differ essentially from any of the "type-definitions," *i. e.*, is not "general welfare" precisely what all patriots insist they are trying to promote? And one might go on.

It is unfortunate for the developing natural science of sociology that its name should be connected with such a pseudo-scientific piece of research. It is normative throughout and is concerned with individual opinions as mediated by the social patterns. Therefore, it is either social psychology, or social ethics, or both. It does not deal with the observable, repetitive behavior of groups and hence is not in the field of sociology.

It may be possible to study the phenomena of patriotism scientifically, or even sociologically, but this reviewer does not think Hunter has done it or even suggested a sound method of doing it.

READ BAIN
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STUTSMAN, RACHEL. *Mental Measurement of Preschool Children, with a Guide for the Administration of the Merrill-Palmer Scale of Mental Tests.* Yonkers-on-Hudson, New York: World Book Company, 1931. x + 368 pp.

An outstanding contribution to the technique of mental testing of young children has been accomplished through a careful rechecking of the author's previously published series of performance tests, with additions and changes. The author has made a serious attempt to meet the criteria she has set up as necessary for proper selection of tests. She has used a large number of children, 631 from twenty different sources.

The book is arranged in four parts. Part one deals with the problems and history of the mental testing of preschool children. Part two describes the preliminary experimentation and the standardization of the scale, and gives statistical results. Part three presents a complete guide for the administering of the scale, including a guide for personality observations, and part four gives illustrative case studies.

Of the criteria set up for the selection of tests, the author has succeeded in meeting, admirably, those involving interest for the child, simplicity of material, objective scoring, differentiation between ages, ease of scoring, variation in difficulty of the test items and the tapping of abilities that most children have had some opportunity to develop. The separate tests are easy to administer, but the amount of equipment needed is considerable and the complete test is rather long. Incomplete information is given as to variety of activities and abilities tested, since only a few intercorrelations are computed, and the contribution of the separate items to the composite score has not been treated. The author points out that her sampling is not entirely adequate and that her number of children is not sufficiently large for complete standardization.

An unusually high correlation with chronological age, $.921 \pm .004$, is reported. Correlations of .78 and .79 with the Stanford-Binet were obtained for three groups of children. The reliability of the scale is not considered.

Interpretation of the scores by standard deviations in terms of score values or mental-age values or by percentile ranks is advocated in preference to the use of intelligence quotients. An I.Q. of 119 was found to have a range of values at different age levels from $+0.5\sigma$ to $+2.0\sigma$; a child of 27 months of age who has an I.Q. of 119 by the Merrill-Palmer scale has therefore attained the same level of superiority as a child of 48 months who has an I.Q. of 154.

The book represents a good step forward in the measurement of mental abilities of young children. It should serve as a substantial foundation for further extensions and refinements.

BETH L. WELLMAN
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OSBURN, W. J., AND ROHAN, BEN J. *Enriching the Curriculum for Gifted Children*. New York: The Macmillan Company, 1931.

This book is, principally, the description of an experiment carried on for five years in the public schools of Appleton, Wisconsin. The first seven chapters are on such general topics as: importance of special instruction for gifted pupils; intelligence testing; education and democracy; curriculum construction; and methods of promotion. Next come three chapters describing the experiment. The second half of the volume presents in detail the outlines, plans, and methods of the pupils' clubs of the experiment. This part also contains numerous samples of writings by pupils. At the end of the book are a brief appendix and an index.

The experiment was in substance as follows: A Thorndike-McCall Reading Test was given to all pupils of the seventh and eighth grades in certain schools. The abiding interests of the pupils was also sought by a questionnaire and other means. Mimeographed outlines and descriptions of various activity clubs were handed to the pupils, who made first, second, and third choices of those they wished to join. Radio, Newspaper, Forestry, Nursing, Mechanics, Salesmanship,

Teaching, and Arts and Crafts were the principal activities of the clubs. The pupils who made a high enough score on the reading test were allowed to become members of one of the clubs, which was directed by the teachers but governed chiefly by the pupils. Pupils whose scores were too low for admission to a club were given remedial help. Practically all pupils finally qualified for membership. "The last year there were about fifty children in remedial groups. They were so anxious to get into clubs that they worked like little Trojans to improve. . . . The result was that before the end of the year all but five or six had successfully passed the standard reading test."

This work will prove helpful to those who wish to provide more study of a pseudo-project kind for brighter pupils, without disturbing the conventional subject-matter organization; but the progressives will find no consolation in it. As a description of an experiment, the book does not necessarily advocate any particular kind of theory or practice. The conclusion of the authors, however, is that the activity clubs are a successful means of providing for gifted pupils.

The principal weakness of the book is the lack of relevancy of the first seven chapters to the rest of the book. Most of the general discussion on such extensive subjects as intelligence testing and curriculum construction has only a remote connection with the experiment described, and is unnecessary for the purposes of the book.

GEORGE FREDERICK MILLER

TANNAHILL, SALLIE B. *Fine Arts for Public School Administrators*. New York: Teachers College, Columbia University.

The purpose of this work, as stated in the preface, is "to show the importance of art as an integral part of the school program." The author hopes this book will help solve the problems in art education which are important to the superintendents, principals, and supervisors. The term Fine Arts includes the arts of painting, sculpture, architecture, textiles, and esthetic phases of the graphic, theatre, costume, household, industrial and civic arts.

The introduction has been written by Mr. George J. Cox, Professor of Fine Arts, Teachers College, Columbia University. He believes that art does serve the imaginative life, and that it does minister to the spiritual faculties of man. Professional skill is no longer an aim; only one child in a hundred may eventually adopt art as a profession. The other ninety-nine may be helped to develop many desirable habits. The aim of modern art instruction is to develop a sound feeling for art that will be of service in whatever situation the child may find himself in, in later life.

Miss Tannahill has divided her book into four chapters. The first discusses some general considerations in teaching Fine Arts: the other three contain the art objectives and the ways of guiding child art in the study of Fine Arts in the elementary, the junior, and the senior high schools.

"The way that leads to creative self-expression is probably the one best suited to the needs and personal equipment of very young children," says Miss Tannahill. Creativeness develops imagination and resourcefulness—qualities so essential in our complex civilization. Appreciation is a natural outgrowth in the processes of creative expression.

No other subject in the school curriculum so happily blends itself with the whole scheme of school life as does art. It stimulates and enriches the words of

social studies and literature. It serves as an axle for the unit of work organization.

Fine Arts have made a distinctive contribution to the elementary school curriculum, but this is not their only purpose. One of the greatest contributions is to give boys and girls a chance to express themselves creatively in clay, paint, crayon, wood, metal, cloth, and other media.

Better citizenship is one of the general objectives in the junior high school art program, for Fine Arts may teach how one may occupy leisure time profitably, and offer a field for exploration and discovering.

If genuine growth and development in art are to be insured from the first through the twelfth grade, there must be the inspiration and the help of an authority who is interested and capable of understanding the units of work.

While this book is written primarily for public school administrators, any teacher interested in present-day tendencies in art education will find in it "numerous ways in which art enriches our lives."

AMY M. SWISHER

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BOWLES, ROSEWELL PAGE. *The Operation and Effects of a Single Salary Schedule*, Contributions to Education No. 518 (New York: Teachers College, Columbia University, 1932), viii + 140 pp.

This study attempts to determine what changes the operation of a single salary schedule has produced on the teaching staff of a city during the nine-year period since the inauguration of the schedule. The period investigated is from 1922-23 to 1930-31.

A comparative analysis is made of the changes in the teaching staff of two Virginia cities, Newport News, having a single salary schedule, and Portsmouth, having a regular salary schedule. The two cities have approximately 35,000 population each, with a number of other characteristics in common. A comparison was also made of the changes in the single salary city with similar changes in all the larger cities of the state having regular salary schedules. The investigation covered selection and assignment of teachers, training, certification, additional training secured while in service, experience, age, salaries paid, teacher load, instructional costs and other cost data, food and housing costs, inbreeding, and the professional morale of the staff.

The most significant finding of the investigation was the extent to which the single salary city had better trained teachers. This was true of both academic and professional training, and teachers in the single salary city took 75 percent more training while in service than did the teachers in the regular salary cities. Not only were better trained teachers retained, but the median experience of teachers who had entered since 1922-23 was higher in the single salary city. No great difference appeared in the percentage of men teachers, in teacher load, in costs of instruction, nor in the percentage of increase in the average salary paid in the two types of cities. The percentage of elementary teachers receiving the higher salaries comparable to high school teachers was greater in the single salary city. On the whole, the single salary schedule was no more expensive to operate, but whether this would be true indefinitely is unknown. The author concludes that the single salary schedule is one method of

securing a better trained, more efficient, satisfied teaching staff. By giving due professional recognition to elementary teachers and facilitating the transfer of teachers from one grade to another, a better spirit of unity in the staff is possible.

On account of the impossibility of segregating the influence of the salary schedule from other administrative policies and practices, the study resolves itself into an analysis of the changes in the teaching staff during the operation of a single salary schedule rather than because of it. One is not warranted in applying the findings of the investigation to more than one city, since it was not determined to what extent this city is typical of all single salary cities. These are limitations of the study, of which the author is not unmindful. The volume is a well organized and readable account, and avoids undue statistical computations which frequently characterize such comparative studies.

Ohio State University E. E. LEWIS

PIAGET, JEAN. *Children's Ideas on Physical Causation* (Paris: Alcan's Library of Child Psychology and Pedagogy, 1932), 347 pp.

The latest volume by Jean Piaget published in Alcan's Library of Child Psychology and Pedagogy is *La Causalité Physique chez l'Enfant*. Previous works of the author in this same field are *Le Langage et la Pensée chez l'Enfant*, 1923; *Le Jugement et le Raissonment chez l'Enfant*, 1924; *La Representation du Monde chez l'Enfant*, 1927.

Piaget is a professor in the University of Neuchatel and in the J. J. Rousseau Institute of Geneva and director of the International Bureau of Education.

The present work continues the examination of children's reactions to their environment, a study based on direct observation and on experiments effected with the aid of seventeen collaborators. The four divisions of the text are: explanation of movement and foresight in the region of elementary physical laws; explanation of machines; children's ideas on reality and causation; summary and conclusions for this volume and for the treatise on the child's perception of the world.

The author develops his topics by introductory explanations, citation of original statements of children, and by critical discussion of the data. The field covered includes experiences of children as to the nature of air, the origin of the wind and breath, movement of clouds and stars, the flowing of water and movements due to weight, the idea of force, the floating of boats, the level of water, shadows, the mechanism of the bicycle, the steam engine, railway trains, automobiles and airplanes. Several stages in the reflections of the child are observed. As to shadows, for example; in the first stage the shadow is regarded as a substance arising from the object and sharing in "night." At the second stage the reference to "night" is dropped. Next, a shadow is substance which light produces. Lastly, the correct explanation is adopted. This method of classifying children's explanations by stages is followed throughout the treatise.

Important conclusions follow. On the notion of reality: truth is midway between empiricism and the *a priori* position. Intellectual evolution implies that intelligence and environment fuse their contributions. As to causation: the more elementary the perceptions of the child the more removed are they from physical environment as we knew it.

Magic is inexplainable unless one concedes that between environment and consciousness are interposed schemata of subjective origin: the world is explained as a function of the self. The conception of necessity (law) seems not to arise from physical experience but from social experience, indeed from life in the family as M. Bovet has shown. Imitation and assimilation are induced by both physical and social environment. Children's logic develops through progressive relativity of ideas, through progressive transformation of primitive mental experiences, and through progressive generalization.

The author's purpose limits him to an expository treatment primarily psychological in character with occasional allusions to major philosophical view-points. Educators are left to their own devices in developing pedagogical implications. But a fascinating and very profitable chapter may be constructed from the findings here recorded. How the child passes through mazes of misconceptions, all of which are in part justified, now becomes clearer. As never before one is convinced that if he would educate a child he must familiarize himself with the weird but prophetic operations of the child's intelligence.

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MARSHALL, M. V. *Education as a Social Force:* As Illustrated by a Study of the Teacher-Training Program in Nova Scotia (Cambridge: Harvard University Press, 1931), xxix + 161 pp.

In this volume the author has approached, as the full title suggests, a two-fold task. In purpose this is excellent. The specific reference to a particular educational situation serves notice that the discussion is not to go forward after the manner of one who carelessly uses verbal brushes to sketch in the detail of his picture. And the early promise is carried through, so much so, indeed, that the illustrative teacher-training program finally becomes the center of interest. As a result, the proposition, "Education as a Social Force," remains on the side-lines, its presence acknowledged, to be sure, but its status merely that of a bystander, nevertheless.

The teacher-training situation in Nova Scotia is described with considerable care. Its historical roots are uncovered, its administrative weaknesses are pointed out, its curriculum limitations are noted, and its points of strength are developed. Furthermore, Chapter I, Part II, places the teacher-training institutions in intimate relationship to the social order of which they are a part. This is done through an analysis of the social situation in which they occur and to which they are to address themselves. The chapter is, therefore, particularly suggestive to educators since it would seem that the school must more and more be aware of the social conditions that surround it. Unless this happens it can be a social force only incidentally and accidentally.

All of this is splendid. Unfortunately, however, when the author turns in the third section to the presentation of a constructive program for teacher-training in Nova Scotia, the interest in specificity results in a welter of detail that heads up in no significant social pattern. To be sure, curricula are suggested in relationship to the types of positions for which teachers should be trained; professional courses are selected for these curricula; and the social setting is made prominent by the introduction as a common element in all curricula of a course that will bring all teachers through a study of Nova Scotia.

The weakness, of course, is apparent: "knowledge of their own province," im-

portant at it may be, provides no guiding program that will make both this course and the professional courses definite factors in fostering a social view. Our professional courses have no glorious past to indicate that their presence in a curriculum will relate education in any important way to the social situation. They, too, must undergo reconstruction in the light of the characteristics and needs of the social setting in which they are but elements in a total educative situation. This problem is not tackled, if, indeed, it is spotted. One feels, therefore, that the complete administrative suggestions that are here put forward for Nova Scotia do little more than raise its teacher-training standards to conform to those which in other parts of the world have had no conspicuous success in making education a positive social force.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

ARMSTRONG, H. C. *Results of Kuhlmann-Anderson Intelligence Test and the Stanford Reading Test in the High-Sixth Grade—Spring Semester, 1932* (Oakland: Oakland Public Schools, Department of Research and Curriculum, 1932), 12 pp.

A statistical analysis of the test results for the Kuhlmann-Anderson Intelligence Test and the Stanford Reading Test in the high-sixth grade of the Oakland Public Schools.

ARMSTRONG, H. C. *Results of Primary Group Intelligence Tests, Fall Semester, 1932* (Oakland: Oakland Public Schools, Department of Research and Curriculum, 1932), 5 pp.

Contains a statistical analysis of the results secured from the application of Detroit First-Grade Intelligence Test, Park-Franzen First Grade Readiness Test, and the Pintner-Cunningham Primary Mental Scale.

BERNING, T. J., AND OTHERS. *A Study of Minnesota Teachers Employed in Elementary Schools, 1931-32* (St. Paul, Minnesota: Statistical Division of Department of Education, August, 1932), 34 pp.

This bulletin contains a summary on data relating to the number and training of Minnesota Elementary Teachers employed during the school year 1931-32.

BERNING, T. J., AND OTHERS. *A Study of Unemployed Elementary Teachers in Minnesota, 1932* (St. Paul, Minnesota: Statistical Division of Department of Education, December, 1932), 33 pp.

This bulletin is a summary of certain data relating to unemployed teachers in Minnesota as reported September 23 to 25, 1932.

BETTS, GILBERT L., FRAZIER, BENJAMIN, W., AND GAMBLE, GUY C. *Selected Bibliography on the Education of Teachers*, National Survey of the Education of Teachers, Bulletin No. 10 (Washington: United States Department of Interior, Office of Education, 1933), xi + 118 pp.

An annotated bibliography on the education of teachers prepared as the first volume of the National Survey of the Education of Teachers.

BRAY, WILLIS JOSEPH. *Achievement in General Chemistry as It Is Related to Certain Learning Abilities*, Bulletin of the Northeast Missouri State Teachers College (July, 1931), 35 pp.

After presenting a brief summary of previous investigations, the author presents a study of the relationship between reading ability, vocabulary, and achievement in general chemistry. Bibliography.

CHEYDLEUR, FREDERIC D. "Attainment Examinations in Foreign Languages at

the University of Wisconsin," Reprint from *The French Review*, VI (February, 1933), pp. 3-46.

Contains a critical analysis of the intermediate knowledge French examination given at the University of Wisconsin.

CHING, J. F. *Low 10th Scholarship Report for the Term Ending December, 1932* (Oakland: Oakland Public Schools, Department of Research and Curriculum, 1932), 13 pp.

A statistical analysis of the subjects, schools, etc., giving low marks in excess of ten percent in the Oakland Public Schools.

EDSON, FRANK M., AND OTHERS. *Summary Report of the Committee on Secondary School Problems*, Supplement to the Proceedings of the 75th Annual Meeting of the Associated Academic Principals of the State of New York, 1932. 48 pp.

The findings of this committee relate to the aims and functions of secondary education, the nature of the high-school student body, suggestions for reorganizing secondary education, and fields recommended for further study.

HICKS, H. S. *The One Room Schools of Illinois*. Compiled for the Illinois State Tax Commission, Springfield, Illinois, 1933.

Primarily a study of school support in the rural schools in the state of Illinois, discussing the development of free public schools in Illinois, railroad taxes in rural school districts, the diminishing enrollment of one-room rural schools, the inequality of school taxes on farm lands, etc.

LEECH, CARL GRAYDON. *The Constitutional and Legal Basis of Education in New Jersey*, Doctor's Thesis (Philadelphia: University of Pennsylvania, 1932), vii + 461 pp.

Contains a statement of the problem, the New Jersey theory of the relationship of the state to education, state agencies in education and their functions, the relation of the state to higher education and to special forms of education, the legal status of local school units and their boards of education, school election, contracts in public school business, the legal basis of financing public education, the legal status of the program of studies, the legal status of teachers, supervisors, and principals, the legal status of personnel, other than teachers, supervisors, and principals, the legal status of the pupil, and conclusions. Bibliography.

MACLATCHY, JOSEPHINE H., editor, *Proceedings of the Ohio State Educational Conference*, Twelfth Annual Session (Columbus: Ohio State University, 1933), 450 pp.

Contains summaries of papers read at the twelfth Ohio State Educational Conference, April, 1932.

Nineteenth Annual Conference on Educational Measurements, Bulletin of the School of Education, Indiana University (Bloomington: Bureau of Coöperative Research, Indiana University, 1932), 139 pp.

Contains papers on individual differences, failures and achievement in measurements, leadership, elementary education in New Austria, teacher training in Europe, experimental studies of progressive methods, why college teachers fail, child accounting in Indiana, improved

methods suggested by recent research, newer methods and general objectives of education, objective measurements in physical education, primary children's comprehension of a social situation, and recent investigations of instruction in spelling.

SELZER, CHARLES A. *Lateral Dominance and Visual Fusion;* Their Application to Difficulties in Reading, Writing, Spelling, and Speech. Studies in Educational Psychology and Educational Measurement. Harvard Monographs in Education, No. 12 (Cambridge, Massachusetts: Harvard University Press, 1933), 119 pp.

Contains a discussion of the origin and causes of handedness; tests for lateral dominance; percentage of handedness and eyedness found in past and present investigations; a comparison of abilities and characteristics of right-dominant and left-dominant individuals; effects of a change of dominance on the reading, writing, spelling, and speech of children; the effect of heterophoria and suspensopsia on the reading of the child; and diagnosis and remedial treatment of disabilities in reading, writing, spelling, and speech. Bibliography.

"The School Board Member," *Research Bulletin of the National Education Association*, XI (January, 1933), 40 pp.

Contains a foreword, a discussion of the place of the school board member in American education, progress in school board organization, the relations of the school board members to others, the school board and the law, the school board in action, and desirable qualifications for school board members. Bibliography.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

ANDERSON, EARL W. "Salaries in Certain Professions," *Educational Research Bulletin*, XII (January, 1933), pp. 1-9.

The author presents a digest of salaries made in the field of medicine, law, dentistry, engineering, journalism, and others.

DOLL, EDGAR A. "The Problem of the Feeble-minded in New Jersey: the Relation of the Public Schools to the Public Institutions," *The Training School Bulletin*, XXIX (January, 1933), pp. 165-173.

This is the third of a series of articles setting forth the relation of the public schools to the public institutions in providing a broader program for the suitable care of the feeble-minded in the state of New Jersey.

JOHNSON, B. LAMAR. "The Permanent Record Form in the Secondary School," *School Review*, XLI (February, 1933), pp. 114-122.

The author makes an analysis of the items included on permanent record forms presenting the average rank values assigned by sixty judges.

SMITH, VIVIAN THOMAS. "Geographical Distribution of Graduates," *Journal of Higher Education*, IV (February, 1933), pp. 85-88.

An analysis of the geographical distribution of the members of the senior classes of 1923 and 1933 in attendance at the University of Illinois.

EXPERIMENTAL STUDIES OF LEARNING AND TEACHING

BALKEN, E. R. "Affective, Volitional and Galvanic Factors in Learning,"

Journal of Experimental Psychology, XVI (February, 1933), pp. 115-128.

From an experimental study on the learning of words that contain paired associates of pleasant, unpleasant, and indifferent character the author concludes that the affective value of the materials did not influence either the efficiency of learning or the galvanic skin reflex deflections elicited during learning.

CLARK, C. C. "Sound Motion Pictures as an Aid in Teaching Science," *Science Education*, XVII (February, 1933), pp. 17-23.

An experimental study in which the author finds that silent films over identical subject matter give better results than sound films.

HARDING, D. W. "Rhythmization and Speed of Work," *British Journal of Psychology*, XXIII (January, 1933), pp. 262-278.

From a study of four groups of typists the author concludes that a positive relationship exists between the degree to which rhythmization is stressed and the subject's capacity for rapid work.

HOLMAN, PORTIA. "The Relationship Between General Mental Development and Manual Dexterity," *British Journal of Psychology*, XXIII (January, 1933), pp. 279-283.

From a study of eighteen school children of average mental ability and thirty-three mentally defective children the authors concludes that on the first day of performing a kinaesthetic test there will be a marked positive association between that ability and intelligence, but the association will be smaller on all subsequent occasions until at the end of a few practice periods the two abilities will be completely independent.

KEFAUVER, GRAYSON N., AND MACKENZIE, GORDON N. "The Value of Secondary School Subjects in the Preparation for Medicine," *California Quarterly of Secondary Education*, VIII (January, 1933), pp. 159-171.

After presenting a summary of previous investigations the authors present a summary of the replies of forty-two deans of medical schools in which chemistry, physics, biology, and zoology are found to be most important.

MAINWARING, JAMES. "Kinaesthetic Factors in the Recall of Musical Experience," *British Journal of Psychology*, XXIII (January, 1933), pp. 284-307.

From an experimental study of fifty school children and forty adults the author finds that the auditory imagery is a relatively negligible element in the memorization of music for instrumental or vocal purposes, the kinaesthetic factor being much more important.

MCGEOCH, JOHN A., AND WHITELY, PAUL L. "Correlations between Certain Measurements of Personality of Traits and of Memorizing," *Journal of Educational Psychology*, XXIV (January, 1933), pp. 16-20.

From two preliminary experimental studies the author concludes that there is a slight tendency toward a relatively consistent relationship between submissiveness and introversion and learning.

MILES, WALTER R. "Abilities of Older Men," *The Personnel Journal*, XI (February, 1933), pp. 352-357.

The author gives age curves showing ability at different ages from 10 to 89.

While there are marked individual differences the decline is not precipitous but progressive throughout later adult life.

MITCHELL, M. B. "The Alleged Warming-up Effect in Memorization," *Journal of Experimental Psychology*, XVI (February, 1933), pp. 138-143.

From a study of sixteen Yale students who learned lists of ten three-place numbers exposed for two seconds on a memory drum the author concludes that there is no reliable quantitative difference found between the number of trials or errors in learning consecutively two lists of ten three-place numbers when the subjects are given daily trials.

PATERSON, DONALD G., AND TINKER, MILES A. "Studies of Typographical Factors Influencing Speed of Reading, X. Style of Type Face," *Journal of Applied Psychology*, XVI (December, 1932), pp. 605-613.

The tenth of a series of experimental studies in which no important differences were found in the speed of reading ordinary type face. Typewriting texts were read 5.1 percent more slowly.

STAGNER, R. "Factors Influencing the Memory Value of Words in a Series," *Journal of Experimental Psychology*, XVI (February, 1933), pp. 129-137.

From an experimental study of the retention of pleasant over unpleasant words the author found a statistically significant difference in favor of the retention of pleasant words over unpleasant words.

THORNDIKE, EDWARD L. "The Influence of Irrelevant Rewards," *Journal of Educational Psychology*, XXIV (January, 1933), pp. 1-15.

From an experimental study of the influence of irrelevant rewards the author concluded that a satisfying after-effect strengthens somewhat the connection to which it is attached even though it is irrelevant to the purpose in the interest of which the connection was made and highly incongruous with the cravings and expectations of the person at the time.

TINKER, MILES A. "Diagnostic and Remedial Reading, II," *Elementary School Journal*, XXXIII (January, 1933), pp. 346-357.

Part two of a summary of investigations relating to diagnostic and remedial reading.

CURRICULUM RESEARCH

BENJAMIN, HAROLD. "Age and Sex Differences in the Toy-Preferences of Young Children," *Journal of Genetic Psychology*, XLI (December, 1932), pp. 417-429.

The author finds a sex preference in the toy-preferences of one hundred young children, ages two to six years.

CHILD WELFARE, GUIDANCE, AND DEVELOPMENT

MCCLURE, W. E. "Intelligence of 600 Juvenile Delinquents," *Journal of Juvenile Research*, XVII (January, 1933), pp. 35-43.

From a study of 602 cases brought before the Juvenile Court of Lucas County at Toledo, the average I.Q. was found to be 79.34, ranging from 40 to 118.

REUSSER, JOHN L. "Personal Attitudes of Delinquent Boys," *Journal of Juvenile Research*, XVII (January, 1933), pp. 19-34.

From a study of 423 training school boys it was found that the boys feel

themselves to be different and more superior than the average boy of the public school. The training school boys were also found to be more peculiar in their attitudes, more out of touch with the feelings of the average boy, and less able to estimate the feelings of others than public school boys.

TRABUE, M. R. "Occupational Ability Patterns," *The Personnel Journal*, XI (February, 1933), pp. 344-351.

The author finds that the ability patterns of some occupations are very much alike, while those of other occupations are decidedly different.

MEASUREMENTS, STATISTICS, AND METHODOLOGY OF SCIENTIFIC RESEARCH

BROOM, M. E. "Note on the Validity and Reliability of the Total Scores Yielded by the Pressey X-0 Test of Emotions," *Journal of Applied Psychology*, XVI (December, 1932), pp. 681-684.

The author finds the validity and reliability to be low.

KUHL, HELEN LOIS, AND STREIT, HELEN. "A Study in Rating Technique with Special Reference to Activity in Preschool Children," *Journal of Genetic Psychology*, XLI (December, 1932), pp. 330-357.

The authors give data on the validity and reliability of a proposed technique of child study.

LEE, J. MURRAY, AND SYMONDS, PERCIVAL M. "New-Type or Objective Tests: A Summary of Recent Investigations," *Journal of Educational Psychology*, XXVI (January, 1933), pp. 21-38.

A summary of recent investigations relating to the new-type or objective tests. Bibliography.

MISCELLANEOUS

EDWARDS, NEWTON. "The Law Governing the Dismissal of Teachers, II," *Elementary School Journal*, XXXIII (January, 1933), pp. 365-376.

Part two of an article summarizing the law of governing the dismissal of teachers.

FLEMMING, EDWIN G. "College Achievement, Intelligence, Personality, and Emotion," *Journal of Applied Psychology*, XVI (December, 1932), pp. 668-674.

The author finds a correlation of .67 between grades and a composite of four scores based upon the Thorndike Test of Intelligence, the Colgate Schedule C-2, and the Pressey X-0 Tests.

"The Coöperative Test Service," *The Educational Record*, XIV (January, 1933), pp. 115-119.

Contains a list of the new tests constructed under a subvention from the General Education Board now available for use in high schools and colleges.

TOUTON, FRANK C. "Research Projects of the Secondary School Level Carried on in California Cities During 1931-1932," *California Quarterly of Secondary Education*, VIII (January, 1933), pp. 189-219.

A summary of research projects conducted in the secondary schools of California for the year 1931-1932.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

First Three-Year Cycle of the Review of Educational Research.—*The Review of Educational Research* represents an attempt to summarize under appropriate topics all the significant research in the field of education. This is the first periodical which has undertaken such a task. Only the results of scientific or semi-scientific research are reviewed. No attempt is made to summarize theoretical or practical discussions.

The plan of the *Review* is to cover the entire field in a three-year cycle. For this purpose the field has been divided into fifteen main topics and one number is devoted to each topic. Each number is prepared by an editorial committee selected from the specialists in research in that topic. In the first cycle the literature for the few years preceding the past three-year period has been included, but in subsequent cycles only the literature for the preceding three years will be cited.

One of the major problems in organizing the *Review* has been to secure a satisfactory basis for the division into topics. The chief requirement is to choose topics which will be mutually exclusive. It would be inappropriate, for example, to devote one number to elementary education and another number to methods, since the classification based on levels of education crosses the classification based on procedures. This would involve serious duplication. In general, the classification chosen is based upon functions or procedures. Some overlapping has been encountered, but the list of topics has been revised for the second cycle so as to minimize this duplication. No serious gaps in the list of topics has been found. The list is as follows:

1. "The Curriculum," January, 1931.
2. "Teacher Personnel," April, 1931.
3. "School Organization," June, 1931.
4. "Special Methods in the Elementary School," October, 1931.
5. "Psychology of the School Subjects," December, 1931.
6. "Special Methods on High-School Level," February, 1932.
7. "Finance and Business Administration," April, 1932.
8. "Tests of Personality and Character," June, 1932.
9. "Tests of Intelligence and Aptitude," October, 1932.
10. "Buildings, Grounds, Equipment, and Supplies," December, 1932.
11. "Educational Tests and Their Use," February, 1933.
12. "Mental and Physical Development," April, 1933.
13. "Child Accounting, Personnel Work, and Guidance," June, 1933.
14. "Psychology of Learning, General Methods, and Supervision," October, 1933.
15. "The Legal Basis of Public Education," December, 1933.

In the next cycle this list will be consolidated somewhat and a topic entitled "Methods of Research" will be added.

The membership of the American Edu-

cational Research Association has been canvassed for criticisms of the first cycle and the Editorial Board has made a careful study of these reactions. In general, they indicate the soundness of the plan adopted. The modifications which have been found necessary relate to matters of detail. Copies of the *Review* can be secured from the National Education Association at Washington, D. C. Dr. F. N. Freeman of Chicago is chairman of the Editorial Board.

Forthcoming Yearbooks of Departments of the N.E.A.—The 1933 yearbook of the Department of Superintendence, "Educational Leadership: Progress and Possibilities," is a topic particularly appropriate under present conditions. One section brings up to date the study in the 1923 yearbook of the status of the city superintendent. Other chapters on the development, history, philosophy, impediments, and rating of educational leadership will have wide appeal. The chairman is A. J. Stoddard, Superintendent of Schools, Providence, Rhode Island. The yearbook became available in February. The 1934 yearbook of the same group will attack some of the major issues in school administration. An attempt will be made to raise controversial points and to assemble the available research and opinion on these questions. The chairman is Ben G. Graham, Superintendent of Schools, Pittsburgh, Pennsylvania. The yearbook will be available in February, 1934. According to the resolution of the Executive Committee, the Commission on the 1935 yearbook should suggest changes for the adjustment of the social science curriculum in the light of present social and economic changes. The chairman is John W. Studebaker, Superintendent of Schools, Des Moines, Iowa. The yearbook will be available in February, 1935.

The 1933 yearbook of the Department of Elementary School Principals is entitled "The Principal and the Libraries." Chapters deal with the status of the library movement in elementary schools, the integration of library and classroom, the school librarian, the organization of the library, the supervisory responsibilities of the principal, and research in children's interests in reading. The chairman of the Editorial Committee for 1933 is Helen B. Shove, Minnehaha School, Minneapolis, Minnesota. The yearbook will be available in April, 1933. The 1934 yearbook of the same organization will deal with the activities of the principal in connection with various auditory and visual teaching devices. Articles are expected to consider teaching and supervisory aspects of the problem. An attempt will be made to report the outcomes of experimental studies in which various types of devices have been used. The chairman of the Editorial Committee for 1934 is John S. Thomas, Clippert School, Detroit, Michigan. The yearbook will be available in April, 1934. The topic tentatively selected for the 1935 yearbook is that of the so-called extra-curriculum activities. Articles and studies are sought which will show that these "school-life activities" are and should be an integral part of education. The chairman of the Editorial Committee for 1935 is Bess Clement, Eliza Clark School, Clarksdale, Mississippi. The yearbook will be available in April, 1935.

The 1933 yearbook of the Department of Classroom Teachers has as its general theme, "the teacher's part in interpreting the school to the public." It presents a body of facts with which the teacher should be familiar and outlines appropriate publicity methods. This is the eighth yearbook of the Department. The chairman is Daisy Lord, Waterbury, Connecti-

ent. Plans for other yearbooks of the Department are now being made.

Forthcoming Yearbooks of the Department of Supervisors and Directors of Instruction.—The sixth yearbook of this department, entitled "Effective Instructional Leadership," is a study of the problem of integration. The kinds and amount of conflict in cities of 100,000 and over were determined by investigation. The Committee in charge has analyzed the causes and proposed remedies. The yearbook was published in February, 1933.

The seventh yearbook, in charge of a committee of which Paul T. Rankin of Detroit is chairman, deals with "Scientific Method in Planning Supervisory Programs." This will appear in February, 1934. The five yearbooks to follow will cover the supervision of the common or elementary school curriculum. That for 1935, in charge of a committee headed by Marquis E. Shattuck of Detroit, will deal with language arts. Others will cover fine and industrial arts, social studies, natural science and arithmetic, and the rhythmic arts.

Five Year Study of English Usage.—To increase the effectiveness of the teaching of English usage, through development of a flexible and practical course of study, and through improvement of drill procedures and teaching methods, is the chief objective of a five-year study of English usage, undertaken in 1931 under a grant from the Carnegie Foundation for the Advancement of Teaching. The study was planned and is directed by L. J. O'Rourke, formerly a member of the faculty of the University of Wisconsin and of Cornell University. C. H. Judd and E. L. Thorndike are acting as a special advisory committee. The Psychological Institute, a Washington, D.C., branch of the Psychological Corporation, is conducting the program, which is nation-wide in scope. More than forty thousand teachers and one and one-half million pupils are coöperating in the study.

As a basis for the suggested course of study, phases of English usage have been tentatively classified under three heads: Group 1 includes essential principles of usage; Group 2 includes principles of secondary importance, niceties, and points upon which opinion is divided; Group 3 includes phases of usage that are of minimum importance, and those which a majority of authorities consider non-essential.

The purpose in making this classification is to divert attention to the essential principles of usage, and thus to insure more practical results for the time and effort expended by teacher and pupil. Findings of the study to date show a serious lack of mastery of English usage in all grades, from the third to the thirteenth.

The assignment of subject matter in sequence is designed to replace the arbitrary and specific assignment of subject matter to grades. The sequence in which essentials of usage can be introduced most effectively is being determined through consideration of: (1) the relation of each principle to every other principle, (2) the practical utility of the principle, and (3) the relative difficulty of the principle. Knowing the order in which principles should be taught, each school or school system can adapt the course of study to its own requirements. This arrangement permits the maximum flexibility consistent with school and class needs.

While the studies which constitute the five-year research program are progress-

ing, teachers, supervisors, and school administrators are deriving practical value from their findings. The present status of mastery of English usage in each grade has been determined objectively, nation-wide grade norms having been computed on four series of survey tests. A series of projects has been outlined to enable schools to interpret findings, and to increase classroom utilization of survey and research programs.

The study of teaching methods as they affect pupils' mastery of usage is being undertaken intensively during the present year. Drill materials which have been developed are designed to determine the relative effectiveness of different teaching techniques. These drill materials will be tried in controlled programs in schools throughout the country. A research edition of the drills for the third grade will be made available for September, 1933. A nominal charge to cover printing and handling will be made for these materials, which include drills for a full year's course, a teachers manual, a survey test, several progress tests, and an achievement test. The Carnegie grant will cover the cost of construction of material and analysis of data.

The schools coöperating in the controlled studies of teaching method will assist not only in evaluating but in perfecting the course of study, and, at the same time, in freeing pupils from the useless instruction that inhibits their understanding and their appreciation of the spoken and written word. Time and energy will be released for stimulating creative writing and for developing greater appreciation of the utility and the romance of language.

Research Program in Commercial Education.—Miss Helen Reynolds, of Ohio University, Athens, Ohio, president of the National Association of Commercial Teacher Training Institutions, has appointed a research commission on the education of business teachers. The purpose of this commission is to provide a national agency for coördinating research in business teacher-training among teachers colleges and universities. The commission is divided into three subcommittees, A, B, and C, in accordance with the three major divisions (social-civic, vocational, and "personal utility") of the research program, prepared by Frederick G. Nichols of the Harvard Graduate School of Education.

The commission will coöperate with any graduate student who may be making a study of national significance in business education. When the problem of such a student has been carefully planned in terms of analysis of the problem and a rather detailed description of the plan of solution, the commission will be glad to receive the statement from the institutional sponsor of the thesis. If, in the judgment of the commission, the study is of a nature to warrant possible publication by the commission as a service bulletin for business teacher-training institutions, the sub-committee to which the thesis problem applies will coöperate with the thesis sponsor both in possible further formulation of the problem and its method of solution, and later in serving as a coöperative reading committee on the final thesis report. Throughout the process of working out the thesis, it will be recognized that the commission is serving purely in an advisory and unofficial relationship with the institutional sponsor for the purpose of coördinating and publishing the best research efforts of national importance in business teacher-training. So far as each institution is concerned a graduate student, of course, will comply with the

institution's own rules and regulations governing thesis writing.

It is the hope of the commission that this plan of national coöperation will prove beneficial to business teacher-training institutions in that research work of high quality on practical problems will be encouraged. To the graduate students themselves, it is hoped that this coöperation of the teacher-training institutions and the commission will prove an incentive to professional research of outstanding quality.

The chairman of the Research Commission on Education of Business Teachers is Paul S. Lomax and the secretary is Herbert A. Tonne, both of New York University, New York City.

Conference on Business Education.—A conference on business education will be held at the University of Chicago on June 29 and 30 under the auspices of its School of Business. The Department of Business Education of the National Education Association and the National Association of Commercial Teacher-Training Institutions plan to hold meetings in Chicago at the time of the University of Chicago conference. Well known workers in the field of secondary business education have agreed to contribute to the program. There will be ample time for discussion of professional problems at the regular meetings.

Investigation in the Philippines.—For more than three years the Philippine Bureau of Education has been actively engaged in the reconstruction of its curriculum, particular attention being given to the setting up of objectives to be accomplished. Formulation of these objectives has been accomplished in twenty-three subjects, among which are elementary and secondary mathematics and vocational subjects such as farm physics, agricultural economics, and woodworking.

In the reconstruction of the curriculum, two types of an experimental general curriculum for secondary pupils were formulated for use in certain interested divisions beginning with the school year 1932-33. Both types of this curriculum include vocational work. In Type A, vocational subjects are required, while in Type B they are optional. The vocational courses which may be offered are: trade (automobile work, general metal work, and woodworking), commercial (retail merchandizing), agricultural (agronomy, horticulture, poultry, and swine,) and home economics.

The testing program has covered in the main the first primary survey of central and barrio schools, the third biennial survery of rural and vocational schools, and the survey of the educational section of the Bureau of Prisons. The results from the primary survey in which arithmetic, reading, language, and dictation were given showed pupils in Grades I and II to be more proficient in arithmetic and reading than in language, and pupils in Grade III to improve somewhat upon the deficiency in language of the pupils in Grades I and II. An almost equal effectiveness of instruction in the central (urban) and barrio (rural) primary schools was revealed by the survey.

From a comparison of the different rural-vocational surveys in 1927, 1929, and 1931 with the three equivalent forms of Series A- Arithmetic, B- Reading, C- Language and Dictation, Advanced Examination, and with the two equivalent forms of Series H- General Science, the gain in median achievement for 1931, other things being equal, showed an improved quality of instruction.

The inmates, both men and women, of the Bureau of Prisons (the insular peni-

tentiary) who had not finished Grade IV were tested with the primary examination in arithmetic, reading, language, dictation, and mental tests. The results showed that the schools of the Bureau of Prisons exceeded the medians of the Bureau of Education in arithmetic, probably because of the inmates' maturity and greater experience with figures, but fell below the medians of the Bureau of Education in reading and language, perhaps because of their limited supply of reading material and their somewhat disorganized system of reading. In the advanced examinations of the same tests given to the inmates who were applicants for teaching positions in the Bureau of Prison schools, only a few obtained higher scores than the median scores of similar groups in the public schools.

The improvement in classroom instruction has been effected in part through research, through better methods of supervision and teaching, and through further revision and reconstruction of the different courses. Drill exercises, especially in arithmetic and in English, were developed from the findings of studies made in these subjects. Teaching methods have improved with the aid of demonstration centers, and with the policy of enlisting the services of only trained teachers in both elementary and secondary schools.

Among the investigations completed during 1931 are textbook studies, analyses of errors in arithmetic and in written composition, and studies of school finance.

The chief of the Measurement and Research Department of the Philippine Bureau of Education is Manuel L. Carreon.

Articulation in Pennsylvania.—In 1928 the Department of Public Instruction and the College Presidents Association joined in a request to the Carnegie Foundation asking the Foundation to underwrite a study of college and secondary-school relationships in Pennsylvania. After considerable planning a joint commission was established for the conduct of what has come to be known as the Pennsylvania study. This study has been directed toward the solution of four major problems:

1. A seven-year cumulative study, beginning with sixth-grade pupils who are followed individually through the junior and senior high school.
2. A five-year cumulative study, beginning with twelfth-grade pupils who are followed individually through college.
3. An analysis of the secondary and higher curriculums presented by candidates in 1928 for the Bachelor's degree, together with objective measurement of their general academic achievement as shown on a comparative examination.
4. The development of an experimental curriculum for three small groups of superior pupils. For pupils in these groups there is provided a unitary curriculum with one or two very broad options, allowing as much flexibility as possible in order to serve individual needs. These curriculums provide for sequence in subject-matter fields, avoiding the concept of precise units of work begun and terminated at given dates. A careful testing program is being carried on in connection with this project in order to determine its effectiveness.

Throughout this inquiry an attempt has been made to establish a sound basis for educational guidance by means of cumulative, objective measurement of the individual's attainment and progress, both in school and out, and the relationship of these attainments to personality factors.

An important phase of the program is an arrangement with a group of outstanding colleges in the United States which have agreed to accept pupils participating in the experimental curriculum on the basis of the cumulative records presented, rather than in terms of the meager information provided by marks, credits, or a single examination. The cumulative, objective record gives definite evidence of the pupil's ability to think and of his power to utilize knowledge in the effective solution of problems, rather than of his ability to pass unrelated courses, or of the facility which he may have developed to pass an examination.

The Superintendent of Public Instruction in Pennsylvania is James N. Rule.

Chancellor Brown Retires.—Harry Woodburn Chase, president of the University of Illinois and former president of the University of North Carolina, was elected the eighth chancellor of New York University to succeed Elmer Ellsworth Brown who will retire on July 1, 1933, after twenty-two years of outstanding service. Dr. Brown, who has devoted more than forty of his seventy-one years to education as teacher, United States Commissioner of Education, and chancellor of New York University, will retire as chancellor emeritus.

Dr. Chase has been president of the University of Illinois since July 5, 1930, and was president of the University of North Carolina between 1920 and 1930. He will be fifty years old in April, 1933. As a speaker last November at the conference sponsored by New York University on "the obligations of the universities to the social order," he expressed a point of view of interest to those engaged in research. "It is the duty of the university to maintain conditions under which men of distinction and quality can live and work, in teaching and in research. Given such men, free to stimulate students and to discover truth, a university exists. Whatever else may be required in response to the needs of a particular social order may be added unto it. Without such men, no matter what one's theory may be, there is no university."

New Denver Director of Research.—Charles E. Greene, member of the editorial staff of the *Journal of Educational Research* and former director of research, Denver public schools, has been promoted to the position of assistant superintendent in charge of secondary education and the opportunity school. The position of director of research will be filled by C. L. Cushman, director of curriculum, who now becomes director of research and curriculum. Thus two major departments of the Denver schools have been consolidated. This reorganization followed the appointment of Homer W. Anderson, deputy superintendent, to the superintendency of the Omaha schools, succeeding J. M. Beveridge who died on October 12, 1932. The position of deputy superintendent included the administration of junior and senior high schools and of the opportunity school. While the position of deputy superintendent will not be filled, the administration of secondary education in the future will be in charge of Charles E. Greene.

Inglis Lecture for 1933.—The annual Inglis Lecture was given on January 13 at the Harvard Graduate School of Education by H. C. Morrison of the University of Chicago. A summary of the address, "The Evolving Common School," follows.

In the past fifty years, the common school has evolved from a continuous edu-

cational system culminating in intellectual maturity to a discontinuous system, marked by arbitrary distinctions between elementary schools, secondary schools, and colleges.

The school system has not adapted itself to the social requirements and economic conditions of the time, but rather, it has taken a backward step in the past fifty years. A tradition which commits the government of our national enterprise in public instruction to 150,000 different school boards, could hardly do otherwise than hamper sound progress in adaptation. Recently, however, there has been a reversion to type. The school system is making some effort to rectify its false step, whereby emphasis was shifted from learning to the outward signs of education, such as diplomas and credits on the different rungs of the ladder that reaches from the public schools to graduate college work.

The development of the junior high schools and colleges, as well as changes in the general method of pedagogy, is once more bringing the school and the social system into harmony. In the immediate past the criterion in the development of American education has been the time spent at school rather than the amount learned. A succession of schools culminating in the college degree stands for education in the minds of most people. If a child succeeded in surviving the eight years of elementary school he had an elementary education, although he was still ignorant of primary rudiments. Similarly, if he could stay first in high school and then in college until the authorities graduated him, he was considered educated although still intellectually infantile. The *reductio ad absurdum* is reached when a student comes forward with a group of credits collected in residence, in correspondence courses, in extension courses, and even, peradventure, in teachers' institutes, and a thesis, and claims a higher degree. Maturity cannot be determined by academic decree, nor does a miracle happen between June when the pupil leaves the high school and September when he enters college.

Professor Morrison stated that there has recently been a tremendous increase in the number of students at schools and colleges, largely because of the present economic condition. The discontinuous method of education places an unnecessary burden upon the taxpayer and the stage has been reached when he can no longer finance the million-dollar high school. As a result, just as economic changes have filled the schools and in the process generated the junior high school and the junior college, so fiscal pressure must in the end force the coalescence of the several parts of the system into a single school with an entirely new kind of structure. If that is good reasoning, we shall only be coming back to a twentieth-century equivalent of the highway which the school system was following up to forty or fifty years ago and unhappily took the wrong turn because the back seat insisted on going that way.

Each Inglis Lecture is published by the Harvard Graduate School of Education.

Changes in Journals.—The new *Educator's Digest*, successor to the magazine, *Survey of Educational Publications*, "presents summaries of educational articles from various current publications, that are of special professional and practical interest." It is intended to enable "busy school officials; teachers, and other interested readers to be familiar with the trend of educational theory and practice with the minimum expenditure of time."

The editor is Isaac O. Winslow, 9 Exchange Terrace, Providence, Rhode Island. The journal is published monthly, except in July and August, at the subscription price of one dollar a year.

The *National Business Education Quarterly* has been launched as the organ of the Department of Business Education, a department of the National Education Association. The editor is Earl W. Barnhart of the Federal Board for Vocational Education. The subscription price for non-members of the Department is one dollar a year.

Social Science Abstracts (Social Science Research Council) and the *Teachers Journal and Abstract* (Greeley, Colorado) have discontinued publication, presumably due to inability to secure the necessary financial support.

Chicago Schools Survey.—This survey, directed by George D. Strayer, was conducted during the school year of 1931-1932. The field work was begun in October, 1931, and was carried on during the fall, winter, and spring months. The contract, which is reproduced in Volume I of the report, indicates that the following fields were agreed upon by the Board of Education and the survey group as the fields for study and analysis: the general administration and supervision of the schools; the business administration of the schools; a school building survey and school building program; an analysis of school costs; the organization of the schools with particular reference to the needs of children, a study of curriculum and courses of study, the special services provided by the schools including health, attendance service and the like; and a study of the personnel employed by the Board of Education. The report on this study was submitted to the Chicago Board of Education on the first day of June, 1932. At that time typewritten copies were presented, but since then the report has been printed in five volumes by Teachers College.

The survey was made under the auspices of the Division of Field Studies of Teachers College, Columbia University. Seventeen members of the staff of Teachers College and ten members from other universities or from public school systems participated in the study. The field workers, seventy-one in number, were drawn from Teachers College, Columbia University; the University of Chicago; Northwestern University; Loyola University; the University of Indiana; and the public school systems of: Columbus, Ohio; Indianapolis, Indiana; and Minneapolis, Minnesota. The staff is unique in the number of institutions and schools systems represented.

The study, according to Dr. N. L. Engelhardt, makes very definite contributions to survey techniques. New areas of educational endeavor are analyzed and discussed for the first time. Probably no more comprehensive survey has been made. The report definitely recommends economies in many fields and gives suggestions as to the program which should be advanced under present economic conditions. Superintendent William J. Bogan of Chicago has expressed the attitude of his professional staff toward the survey in a letter addressed to the Dean of Teachers College. This letter, in part, read as follows:

"I have taken the stand that as this report was made by honest men in a scientific manner the school system ought to carry out the recommendations as far as possible.... Many of the criticisms of the school system are severe but I know they are just, and I know that they will result in great improvement. This report is virtually a library in education in which may be found nearly every sub-

ject in which administrators should be interested."

Survey of the University of Chicago.—In 1924, the General Education Board made a grant of funds to the University of Chicago for a survey of that institution. The work on the survey, which was begun in October, 1929, has now been completed, and the report is being published by the University of Chicago Press in a set of twelve volumes. The date of publication of the complete series has been scheduled as April 4, 1933.

Floyd W. Reeves, professor of education at the University of Chicago, has served as director of the entire survey program. A separate staff has been chosen for each volume of the report, the staff members coming principally from the faculty and administrative officers of the University, but including also a number of persons from other institutions. The titles of the twelve volumes and their authors are as follows:

I. Trends in University Growth, by Floyd W. Reeves, Ernest C. Miller, and John Dale Russell.
II. The Organization and Administration of the University, by Floyd W. Reeves, Frederick J. Kelly, John Dale Russell, and George A. Works.
III. The University Faculty, by Floyd W. Reeves, Nelson B. Henry, Frederick J. Kelly, Arthur J. Klein, and John Dale Russell.
IV. Instructional Problems in the University, by Floyd W. Reeves, W. E. Peik, and John Dale Russell.
V. Admission and Retention of University Students, by Floyd W. Reeves and John Dale Russell.
VI. The Alumni of the Colleges, by Floyd W. Reeves and John Dale Russell.
VII. The University Libraries, by M. Llewellyn Raney.
VIII. University Extension Services, by Floyd W. Reeves, C.O. Thompson, Arthur J. Klein, and John Dale Russell.
IX. University Plant Facilities, by Floyd W. Reeves, Frederick J. Kelly, and John Dale Russell.
X. Some University Student Problems, by Floyd W. Reeves and John Dale Russell.
XI. Class Size and University Costs, by Floyd W. Reeves, Nelson B. Henry, and John Dale Russell.
XII. The Oriental Institute, by James Henry Breasted.

Methodist Survey.—The survey program of Methodist educational institutions, begun in the Autumn of 1929, was completed during the year of 1932. The general program was under the direction of Floyd W. Reeves, professor of education at the University of Chicago. John Dale Russell, associate professor of education at the University of Chicago, served as assistant director. The staff for the survey of the four-year colleges, thirty-five in number, consisted of the director; the assistant director; and in addition H. C. Gregg, now business manager of Iowa State College at Ames; L. E. Blauch, now executive secretary of the Survey of the Dental Curriculum; and A. J. Brumbaugh, dean of students in the College at the University of Chicago. The final report of this survey was published in May, 1932, by the University of Chicago Press under the title *The Liberal Arts College.* Each institution in addition to the published report received a confidential report dealing specifically with its own problems.

The staff for the survey of the secondary schools, in addition to the director and the assistant director, consisted of: Dean Maurice F. Seay, Union College (Kentucky) and W. Carson Ryan, Director of Indian Education, United States Department of the Interior. Some twenty-five secondary schools (including junior colleges) were surveyed. The final

reports have been made to the institutions involved, but a published report is not contemplated at this time.

The staff for the survey of the theological seminaries included the director and the assistant director of the survey, and, in addition, H. C. Gregg; Mark A. May, professor of educational psychology at Yale University; and Luther A. Weigle, Dean of the Divinity School at Yale University. Three theological seminaries were included in this survey. The confidential reports have been practically completed but it is not expected that a published report on the survey of these institutions will be prepared.

Only one of the large universities of the Methodist Episcopal Church (Syracuse University) has been included in the survey program. The staff for the survey of Syracuse University included, in addition to the director and the assistant director, President R. A. Kent of the University of Louisville, Dean George A. Works of the University of Chicago, and A. J. Brumbaugh. The report of this survey was rendered to Syracuse University in confidential form.

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